```
  1 AGCATCCTGA GTAATGAGTG GCCTGGGCCG GAGCAGGCGA GGTGGCCGGA GCCGTGTGGA CCAGGAGGAG CGCTTTCCAC AGGGCCTGTG GACGGGGGTG
    TCGTAGGACT CATTACTCAC CGGACCCGGC CTCGTCCGCT CCACCGGCCT CGGCACACCT GGTCCTCCTC GCGAAAGGTG TCCCGGACAC CTGCCCCCAC
  1                M  S  G   L  G  R   S  R  R   G  G  R  S   R  V  D   Q  E  E   R  F  P  Q   G  L  W   T  G  V

101 GCTATGAGAT CCTGCCCCGA AGAGCAGTAC TGGGATCCTC TGCTGGGTAC CTGCATGTCC TGCAAAACCA TTTGCAACCA TCAGAGCCAG CGCACCTGTG
    CGATACTCTA GGACGGGGCT TCTCGTCATG ACCCTAGGAG ACGACCCATG GACGTACAGG ACGTTTTGGT AAACGTTGGT AGTCTCGGTC GCGTGGACAC
 30 A  M  R  S   C  P  E   E  Q  Y   W  D  P  L   L  G  T   C  M  S   C  K  T  I   C  N  H   Q  S  Q   R  T  C  A

201 CAGCCTTCTG CAGGTCACTC AGCTGCCGCA AGGAGCAAGG CAAGTTCTAT GACCATCTCC TGAGGGACTG CATCAGCTGT GCCTCCATCT GTGGACAGCA
    GTCGGAAGAC GTCCAGTGAG TCGACGGCGT TCCTCGTTCC GTTCAAGATA CTGGTAGAGG ACTCCCTGAC GTAGTCGACA CGGAGGTAGA CACCTGTCGT
 64  A  F  C   R  S  L   S  C  R  K   E  Q  G   K  F  Y   D  H  L  L   R  D  C   I  S  C   A  S  I  C   G  Q  H

301 CCCTAAGCAA TGTGCATACT TCTGTGAGAA CAAGCTCAGG AGCCCAGTGA ACCTTCCACC AGAGCTCAGG AGACAGCGGA GTGGAGAAGT TGAAAACAAT
    GGGATTCGTT ACACGTATGA AGACACTCTT GTTCGAGTCC TCGGGTCACT TGGAAGGTGG TCTCGAGTCC TCTGTCGCCT CACCTCTTCA ACTTTTGTTA
 97  P  K  Q   C  A  Y  F   C  E  N   K  L  R   S  P  V  N   L  P  P   E  L  R   R  Q  R  S   G  E  V   E  N  N

401 TCAGACAACT CGGGAAGGTA CCAAGGATTG GAGCACAGAG GCTCAGAAGC AAGTCCAGCT CTCCCGGGGC TGAAGCTGAG TGCAGATCAG GTGGCCCTGG
    AGTCTGTTGA GCCCTTCCAT GGTTCCTAAC CTCGTGTCTC CGAGTCTTCG TTCAGGTCGA GAGGGCCCCG ACTTCGACTC ACGTCTAGTC CACCGGGACC
130 S  D  N  S   G  R  Y   Q  G  L   E  H  R  G   S  E  A   S  P  A   L  P  G  L   K  L  S   A  D  Q   V  A  L  V

501 TCTACAGCAC GCTGGGGCTC TGCCTGTGTG CCGTCCTCTG CTGCTTCCTG GTGGCGGTGG CCTGCTTCCT CAAGAAGAGG GGGGATCCCT GCTCCTGCCA
    AGATGTCGTG CGACCCCGAG ACGGACACAC GGCAGGAGAC GACGAAGGAC CACCGCCACC GGACGAAGGA GTTCTTCTCC CCCCTAGGGA CGAGGACGGT
164  Y  S  T   L  G  L   C  L  C  A   V  L  C   C  F  L   V  A  V  A   C  F  L   K  K  R   G  D  P  C   S  C  Q

601 GCCCCGCTCA AGGCCCCGTC AAAGTCCGGC CAAGTCTTCC CAGGATCACG CGATGGAAGC CGGCAGCCCT GTGAGCACAT CCCCCGAGCC AGTGGAGACC
    CGGGGCGAGT TCCGGGGCAG TTTCAGGCCG GTTCAGAAGG GTCCTAGTGC GCTACCTTCG GCCGTCGGGA CACTCGTGTA GGGGGCTCGG TCACCTCTGG
197  P  R  S   R  P  R  Q   S  P  A   K  S  S   Q  D  H  A   M  E  A   G  S  P   V  S  T  S   P  E  P   V  E  T

701 TGCAGCTTCT GCTTCCCTGA GTGCAGGGCG CCCACGCAGG AGAGCGCAGT CACGCCTGGG ACCCCCGACC CCACTTGTGC TGGAAGGTGG GGGTGCCACA
    ACGTCGAAGA CGAAGGGACT CACGTCCCGC GGGTGCGTCC TCTCGCGTCA GTGCGGACCC TGGGGGCTGG GGTGAACACG ACCTTCCACC CCCACGGTGT
230 C  S  F  C   F  P  E   C  R  A   P  T  Q  E   S  A  V   T  P  G   T  P  D  P   T  C  A   G  R  W   G  C  H  T

801 CCAGGACCAC AGTCCTGCAG CCTTGCCCAC ACATCCCAGA CAGTGGCCTT GGCATTGTGT GTGTGCCTGC CCAGGAGGGG GGCCCAGGTG CATAAATGGG
    GGTCCTGGTG TCAGGACGTC GGAACGGGTG TGTAGGGTCT GTCACCGGAA CCGTAACACA CACACGGACG GGTCCTCCCC CCGGGTCCAC GTATTTACCC
264  R  T  T   V  L  Q   P  C  P  H   I  P  D   S  G  L   G  I  V  C   V  P  A   Q  E  G   G  P  G  A   O
```

FIG. 1A

```
 901 GGTCAGGGAG GGAAAGGAGG AGGGAGAGAG ATGGAGAGGA GGGGAGAGAG AAAGAGAGGT GGGGAGAGGG GAGAGAGATA TGAGGAGAGA GAGACAGAGG
     CCAGTCCCTC CCTTTCCTCC TCCCTCTCTC TACCTCTCCT CCCCTCTCTC TTTCTCTCCA CCCCTCTCCC CTCTCTCTAT ACTCCTCTCT CTCTGTCTCC

1001 AGGCAGAAAG GGAGAGAAAC AGAGGAGACA GAGAGGGAGA GAGAGACAGA GGGAGAGAGA GACAGAGGGG AAGAGAGGCA GAGAGGGAAA GAGGCAGAGA
     TCCGTCTTTC CCTCTCTTTG TCTCCTCTGT CTCTCCCTCT CTCTCTGTCT CCCTCTCTCT CTGTCTCCCC TTCTCTCCGT CTCTCCCTTT CTCCGTCTCT

1101 AGGAAAGAGA CAGGCAGAGA AGGAGAGAGG CAGAGAGGGA GAGAGGCAGA GAGGGAGAGA GGCAGAGAGA CAGAGAGGGA GAGAGGGACA GAGAGAGATA
     TCCTTTCTCT GTCCGTCTCT TCCTCTCTCC GTCTCTCCCT CTCTCCGTCT CTCCCTCTCT CCGTCTCTCT GTCTCTCCCT CTCTCCCTGT CTCTCTCTAT

1201 GAGCAGGAGG TCGGGGCACT CTGAGTCCCA GTTCCCAGTG CAGCTGTAGG TCGTCATCAC CTAACCACAC GTGCAATAAA GTCCTCGTGC CTGCTGCTCA
     CTCGTCCTCC AGCCCCGTGA GACTCAGGGT CAAGGGTCAC GTCGACATCC AGCAGTAGTG GATTGGTGTG CACGTTATTT CAGGAGCACG GACGACGAGT

1301 CAGCCCCCGA GAGCCCCTCC TCCTGGAGAA TAAAACCTTT GGCAGCTGCC CTTCCTCAAA AAAAAAAAAA AAAAAAA
     GTCGGGGGCT CTCGGGGAGG AGGACCTCTT ATTTTGGAAA CCGTCGACGG GAAGGAGTTT TTTTTTTTTT TTTTTTT
```

FIG. 1B

```
  1 AAGACTCAAA CTTAGAAACT TGAATTAGAT GTGGTATTCA AATCCTTACG TGCCGCGAAG ACACAGACAG CCCCCGTAAG AACCCACGAA GCAGGCGAAG
    TTCTGAGTTT GAATCTTTGA ACTTAATCTA CACCATAAGT TTAGGAATGC ACGGCGCTTC TGTGTCTGTC GGGGGCATTC TTGGGTGCTT CGTCCGCTTC

101 TTCATTGTTC TCAACATTCT AGCTGCTCTT GCTGCATTTG CTCTGGAATT CTTGTAGAGA TATTACTTGT CCTTCCAGGC TGTTCTTTCT GTAGCTCCCT
    AAGTAACAAG AGTTGTAAGA TCGACGAGAA CGACGTAAAC GAGACCTTAA GAACATCTCT ATAATGAACA GGAAGGTCCG ACAAGAAAGA CATCGAGGGA

201 TGTTTTCTTT TTGTGATCAT GTTGCAGATG GCTGGGCAGT GCTCCCAAAA TGAATATTTT GACAGTTTGT TGCATGCTTG CATACCTTGT CAACTTCGAT
    ACAAAAGAAA AACACTAGTA CAACGTCTAC CGACCCGTCA CGAGGGTTTT ACTTATAAAA CTGTCAAACA ACGTACGAAC GTATGGAACA GTTGAAGCTA
  1                    Me tLeuGlnMet AlaGlyGlnC ysSerGlnAs nGluTyrPhe AspSerLeuL euHisAlaCy sIleProCys GlnLeuArgC

301 GTTCTTCTAA TACTCCTCCT CTAACATGTC AGCGTTATTG TAATGCAAGT GTGACCAATT CAGTGAAAGG AACGAATGCG ATTCTCTGGA CCTGTTTGGG
    CAAGAAGATT ATGAGGAGGA GATTGTACAG TCGCAATAAC ATTACGTTCA CACTGGTTAA GTCACTTTCC TTGCTTACGC TAAGAGACCT GGACAAACCC
 29 ysSerSerAs nThrProPro LeuThrCysG lnArgTyrCy sAsnAlaSer ValThrAsnS erValLysGl yThrAsnAla IleLeuTrpT hrCysLeuGl

401 ACTGAGCTTA ATAATTTCTT TGGCAGTTTT CGTGCTAATG TTTTTGCTAA GGAAGATAAG CTCTGAACCA TTAAAGGACG AGTTTAAAAA CACAGGATCA
    TGACTCGAAT TATTAAAGAA ACCGTCAAAA GCACGATTAC AAAAACGATT CCTTCTATTC GAGACTTGGT AATTTCCTGC TCAAATTTTT GTGTCCTAGT
 62 yLeuSerLeu IleIleSerL euAlaValPh eValLeuMet PheLeuLeuA rgLysIleSe rSerGluPro LeuLysAspG luPheLysAs nThrGlySer

501 GGTCTCCTGG GCATGGCTAA CATTGACCTG GAAAAGAGCA GGACTGGTGA TGAAATTATT CTTCCGAGAG GCCTCGAGTA CACGGTGGAA GAATGCACCT
    CCAGAGGACC CGTACCGATT GTAACTGGAC CTTTTCTCGT CCTGACCACT ACTTTAATAA GAAGGCTCTC CGGAGCTCAT GTGCCACCTT CTTACGTGGA
 95 GlyLeuLeuG lyMetAlaAs nIleAspLeu GluLysSerA rgThrGlyAs pGluIleIle LeuProArgG lyLeuGluTy rThrValGlu GluCysThrC

601 GTGAAGACTG CATCAAGAGC AAACCGAAGG TCGACTCTGA CCATTGCTTT CCACTCCCAG CTATGGAGGA AGGCGCAACC ATTCTTGTCA CCACGAAAAC
    CACTTCTGAC GTAGTTCTCG TTTGGCTTCC AGCTGAGACT GGTAACGAAA GGTGAGGGTC GATACCTCCT TCCGCGTTGG TAAGAACAGT GGTGCTTTTG
129 ysGluAspCy sIleLysSer LysProLysV alAspSerAs pHisCysPhe ProLeuProA laMetGluGl uGlyAlaThr IleLeuValT hrThrLysTh

701 GAATGACTAT TGCAAGAGCC TGCCAGCTGC TTTGAGTGCT ACGGAGATAG AGAAATCAAT TTCTGCTAGG TAATTAACCA TTTCGACTCG AGCAGTGCCA
    CTTACTGATA ACGTTCTCGG ACGGTCGACG AAACTCACGA TGCCTCTATC TCTTTAGTTA AAGACGATCC ATTAATTGGT AAAGCTGAGC TCGTCACGGT
162 rAsnAspTyr CysLysSerL euProAlaAl aLeuSerAla ThrGluIleG luLysSerIl eSerAlaArg OC*

801 CTTTAAAAAT CTTTTGTCAG AATAGATGAT GTGTCAGATC TCTTTAGGAT GACTGTATTT TTCAGTTGCC GATACAGCTT TTTGTCCTCT AACTGTGGAA
    GAAATTTTTA GAAAACAGTC TTATCTACTA CACAGTCTAG AGAAATCCTA CTGACATAAA AAGTCAACGG CTATGTCGAA AAACAGGAGA TTGACACCTT

901 ACTCTTTATG TTAGATATAT TTCTCTAGGT TACTGTTGGG AGCTTAATGG TAGAAACTTC CTTGGTTTCA TGATTAAAGT CTTTTTTTTT CCTGA
    TGAGAAATAC AATCTATATA AAGAGATCCA ATGACAACCC TCGAATTACC ATCTTTGAAG GAACCAAAGT ACTAATTTCA GAAAAAAAAA GGACT
```

FIG. 2

```
  1 ATGGATGACT CCACAGAAAG GGAGCAGTCA CGCCTTACTT CTTGCCTTAA GAAAAGAGAA GAAATGAAAC TGAAGGAGTG TGTTTCCATC CTCCCACGGA
    TACCTACTGA GGTGTCTTTC CCTCGTCAGT GCGGAATGAA GAACGGAATT CTTTTCTCTT CTTTACTTTG ACTTCCTCAC ACAAAGGTAG GAGGGTGCCT
  1 M  D  D  S   T  E  R   E  Q  S   R  L  T  S   C  L  K   K  R  E   E  M  K  L   K  E  C   V  S  I   L  P  R  K

101 AGGAAAGCCC CTCTGTCCGA TCCTCCAAAG ACGGAAAGCT GCTGGCTGCA ACCTTGCTGC TGGCACTGCT GTCTTGCTGC CTCACGGTGG TGTCTTTCTA
    TCCTTTCGGG GAGACAGGCT AGGAGGTTTC TGCCTTTCGA CGACCGACGT TGGAACGACG ACCGTGACGA CAGAACGACG GAGTGCCACC ACAGAAAGAT
 35   E  S  P   S  V  R   S  S  K  D   G  K  L   L  A  A   T  L  L  L   A  L  L   S  C  C   L  T  V  V   S  F  Y

201 CCAGGTGGCC GCCCTGCAAG GGGACCTGGC CAGCCTCCGG GCAGAGCTGC AGGGCCACCA CGCGGAGAAG CTGCCAGCAG GAGCAGGAGC CCCCAAGGCC
    GGTCCACCGG CGGGACGTTC CCCTGGACCG GTCGGAGGCC CGTCTCGACG TCCCGGTGGT GCGCCTCTTC GACGGTCGTC CTCGTCCTCG GGGGTTCCGG
 68  Q  V  A   A  L  Q  G   D  L  A   S  L  R   A  E  L  Q   G  H  H   A  E  K   L  P  A  G   A  G  A   P  K  A

301 GGCTTGGAGG AAGCTCCAGC TGTCACCGCG GGACTGAAAA TCTTTGAACC ACCAGCTCCA GGAGAAGGCA ACTCCAGTCA GAACAGCAGA AATAAGCGTG
    CCGAACCTCC TTCGAGGTCG ACAGTGGCGC CCTGACTTTT AGAAACTTGG TGGTCGAGGT CCTCTTCCGT TGAGGTCAGT CTTGTCGTCT TTATTCGCAC
101 G  L  E  E   A  P  A   V  T  A   G  L  K  I   F  E  P   P  A  P   G  E  G  N   S  S  Q   N  S  R   N  K  R  A

401 CCGTTCAGGG TCCAGAAGAA ACAGTCACTC AAGACTGCTT GCAACTGATT GCAGACAGTG AAACACCAAC TATACAAAAA GGATCTTACA CATTTGTTCC
    GGCAAGTCCC AGGTCTTCTT TGTCAGTGAG TTCTGACGAA CGTTGACTAA CGTCTGTCAC TTTGTGGTTG ATATGTTTTT CCTAGAATGT GTAAACAAGG
135   V  Q  G   P  E  E   T  V  T  Q   D  C  L   Q  L  I   A  D  S  E   T  P  T   I  Q  K   G  S  Y  T   F  V  P

501 ATGGCTTCTC AGCTTTAAAA GGGGAAGTGC CCTAGAAGAA AAAGAGAATA AAATATTGGT CAAAGAAACT GGTTACTTTT TTATATATGG TCAGGTTTTA
    TACCGAAGAG TCGAAATTTT CCCCTTCACG GGATCTTCTT TTTCTCTTAT TTTATAACCA GTTTCTTTGA CCAATGAAAA AATATATACC AGTCCAAAAT
168  W  L  L   S  F  K  R   G  S  A   L  E  E   K  E  N  K   I  L  V   K  E  T   G  Y  F  F   I  Y  G   Q  V  L

601 TATACTGATA AGACCTACGC CATGGGACAT CTAATTCAGA GGAAGAAGGT CCATGTCTTT GGGGATGAAT TGAGTCTGGT GACTTTGTTT CGATGTATTC
    ATATGACTAT TCTGGATGCG GTACCCTGTA GATTAAGTCT CCTTCTTCCA GGTACAGAAA CCCCTACTTA ACTCAGACCA CTGAAACAAA GCTACATAAG
201 Y  T  D  K   T  Y  A   M  G  H   L  I  Q  R   K  K  V   H  V  F   G  D  E  L   S  L  V   T  L  F   R  C  I  Q

701 AAAATATGCC TGAAACACTA CCCAATAATT CCTGCTATTC AGCTGGCATT GCAAAACTGG AAGAAGGAGA TGAACTCCAA CTTGCAATAC CAAGAGAAAA
    TTTTATACGG ACTTTGTGAT GGGTTATTAA GGACGATAAG TCGACCGTAA CGTTTTGACC TTCTTCCTCT ACTTGAGGTT GAACGTTATG GTTCTCTTTT
235   N  M  P   E  T  L   P  N  N  S   C  Y  S   A  G  I   A  K  L  E   E  G  D   E  L  Q   L  A  I  P   R  E  N

801 TGCACAAATA TCACTGGATG GAGATGTCAC ATTTTTTGGT GCATTGAAAC TGCTGTGA
    ACGTGTTTAT AGTGACCTAC CTCTACAGTG TAAAAAACCA CGTAACTTTG ACGACACT
268  A  Q  I   S  L  D  G   D  V  T   F  F  G   A  L  K  L   L  O
```

FIG. 3

```
  1 GGTACGAGGC TTCCTAGAGG GACTGGAACC TAATTCTCCT GAGGCTGAGG GAGGGTGGAG GGTCTCAAGG CAACGCTGGC CCCACGACGG AGTGCCAGGA
    CCATGCTCCG AAGGATCTCC CTGACCTTGG ATTAAGAGGA CTCCGACTCC CTCCCACCTC CCAGAGTTCC GTTGCGACCG GGGTGCTGCC TCACGGTCCT

101 GCACTAACAG TACCCTTAGC TTGCTTTCCT CCTCCCTCCT TTTTATTTTC AAGTTCCTTT TTATTTCTCC TTGCGTAACA ACCTTCTTCC CTTCTGCACC
    CGTGATTGTC ATGGGAATCG AACGAAAGGA GGAGGGAGGA AAAATAAAAG TTCAAGGAAA AATAAAGAGG AACGCATTGT TGGAAGAAGG GAAGACGTGG

201 ACTGCCCGTA CCCTTACCCG CCCCGCCACC TCCTTGCTAC CCCACTCTTG AAACCACAGC TGTTGGCAGG GTCCCCAGCT CATGCCAGCC TCATCTCCTT
    TGACGGGCAT GGGAATGGGC GGGGCGGTGG AGGAACGATG GGGTGAGAAC TTTGGTGTCG ACAACCGTCC CAGGGGTCGA GTACGGTCGG AGTAGAGGAA
  1                                                                                             M  P  A   S  S  P  F

301 TCTTGCTAGC CCCCAAAGGG CCTCCAGGCA ACATGGGGGG CCCAGTCAGA GAGCCGGCAC TCTCAGTTGC CCTCTGGTTG AGTTGGGGGG CAGCTCTGGG
    AGAACGATCG GGGGTTTCCC GGAGGTCCGT TGTACCCCCC GGGTCAGTCT CTCGGCCGTG AGAGTCAACG GGAGACCAAC TCAACCCCCC GTCGAGACCC
  8  L  L  A   P  K  G   P  P  G  N   M  G  G   P  V  R   E  P  A  L   S  V  A   L  W  L   S  W  G  A   A  L  G

401 GGCCGTGGCT TGTGCCATGG CTCTGCTGAC CCAACAAACA GAGCTGCAGA GCCTCAGGAG AGAGGTGAGC CGGCTGCAGG GGACAGGAGG CCCCTCCCAG
    CCGGCACCGA ACACGGTACC GAGACGACTG GGTTGTTTGT CTCGACGTCT CGGAGTCCTC TCTCCACTCG GCCGACGTCC CCTGTCCTCC GGGGAGGGTC
 41  A  V  A   C  A  M  A   L  L  T   Q  Q  T   E  L  Q  S   L  R  R   E  V  S   R  L  Q  G   T  G  G   P  S  Q

501 AATGGGGAAG GGTATCCCTG GCAGAGTCTC CCGGAGCAGA GTTCCGATGC CCTGGAAGCC TGGGAGAATG GGGAGAGATC CCGGAAAAGG AGAGCAGTGC
    TTACCCCTTC CCATAGGGAC CGTCTCAGAG GGCCTCGTCT CAAGGCTACG GGACCTTCGG ACCCTCTTAC CCCTCTCTAG GGCCTTTTCC TCTCGTCACG
 74 N  G  E  G   Y  P  W   Q  S  L   P  E  Q  S   S  D  A   L  E  A   W  E  N  G   E  R  S   R  K  R   R  A  V  L

601 TCACCCAAAA ACAGAAGAAG CAGCACTCTG TCCTGCACCT GGTTCCCATT AACGCCACCT CCAAGGATGA CTCCGATGTG ACAGAGGTGA TGTGGCAACC
    AGTGGGTTTT TGTCTTCTTC GTCGTGAGAC AGGACGTGGA CCAAGGGTAA TTGCGGTGGA GGTTCCTACT GAGGCTACAC TGTCTCCACT ACACCGTTGG
108  T  Q  K   Q  K  K   Q  H  S  V   L  H  L   V  P  I   N  A  T  S   K  D  D   S  D  V   T  E  V  M   W  Q  P

701 AGCTCTTAGG CGTGGGAGAG GCCTACAGGC CCAAGGATAT GGTGTCCGAA TCCAGGATGC TGGAGTTTAT CTGCTGTATA GCCAGGTCCT GTTTCAAGAC
    TCGAGAATCC GCACCCTCTC CGGATGTCCG GGTTCCTATA CCACAGGCTT AGGTCCTACG ACCTCAAATA GACGACATAT CGGTCCAGGA CAAAGTTCTG
141  A  L  R   R  G  R  G   L  Q  A   Q  G  Y   G  V  R  I   Q  D  A   G  V  Y   L  L  Y  S   Q  V  L   F  Q  D

801 GTGACTTTCA CCATGGGTCA GGTGGTGTCT CGAGAAGGCC AAGGAAGGCA GGAGACTCTA TTCCGATGTA TAAGAAGTAT GCCCTCCCAC CCGGACCGGG
    CACTGAAAGT GGTACCCAGT CCACCACAGA GCTCTTCCGG TTCCTTCCGT CCTCTGAGAT AAGGCTACAT ATTCTTCATA CGGGAGGGTG GGCCTGGCCC
174 V  T  F  T   M  G  Q   V  V  S   R  E  G  Q   G  R  Q   E  T  L   F  R  C  I   R  S  M   P  S  H   P  D  R  A

901 CCTACAACAG CTGCTATAGC GCAGGTGTCT TCCATTTACA CCAAGGGGAT ATTCTGAGTG TCATAATTCC CCGGGCAAGG GCGAAACTTA ACCTCTCTCC
    GGATGTTGTC GACGATATCG CGTCCACAGA AGGTAAATGT GGTTCCCCTA TAAGACTCAC AGTATTAAGG GGCCCGTTCC CGCTTTGAAT TGGAGAGAGG
208  Y  N  S   C  Y  S   A  G  V  F   H  L  H   Q  G  D   I  L  S  V   I  I  P   R  A  R   A  K  L  N   L  S  P
```

FIG. 4A

```
1001 ACATGGAACC TTCCTGGGGT TTGTGAAACT GTGATTGTGT TATAAAAAGT GGCTCCCAGC TTGGAAGACC AGGGTGGGTA CATACTGGAG ACAGCCAAGA
     TGTACCTTGG AAGGACCCCA AACACTTTGA CACTAACACA ATATTTTTCA CCGAGGGTCG AACCTTCTGG TCCCACCCAT GTATGACCTC TGTCGGTTCT
 241  H  G  T   F  L  G  F   V  K  L   O

1101 GCTGAGTATA TAAAGGAGAG GGAATGTGCA GGAACAGAGG CATCTTCCTG GGTTTGGCTC CCCGTTCCTC ACTTTTCCCT TTTCATTCCC ACCCCCTAGA
     CGACTCATAT ATTTCCTCTC CCTTACACGT CCTTGTCTCC GTAGAAGGAC CCAAACCGAG GGGCAAGGAG TGAAAAGGGA AAAGTAAGGG TGGGGGATCT

1201 CTTTGATTTT ACGGATATCT TGCTTCTGTT CCCCATGGAG CTCCGAATTC TTGCGTGTGT GTAGATGAGG GGCGGGGGAC GGGCGCCAGG CATTGTTCAG
     GAAACTAAAA TGCCTATAGA ACGAAGACAA GGGGTACCTC GAGGCTTAAG AACGCACACA CATCTACTCC CCGCCCCCTG CCCGCGGTCC GTAACAAGTC

1301 ACCTGGTCGG GGCCCACTGG AAGCATCCAG AACAGCACCA CCATCTTA
     TGGACCAGCC CCGGGTGACC TTCGTAGGTC TTGTCGTGGT GGTAGAAT
```

FIG. 4B

PRO	XXXXXXXXXXXXXXX	(Length = 15 amino acids)
Comparison Protein	XXXXXYYYYYYY	(Length = 12 amino acids)

% amino acid sequence identity =

(the number of identically matching amino acid residues between the two polypeptide sequences as determined by ALIGN-2) divided by (the total number of amino acid residues of the PRO polypeptide) =

5 divided by 15 = 33.3%

FIG. 5A

PRO	XXXXXXXXXX	(Length = 10 amino acids)
Comparison Protein	XXXXXYYYYYYZZYZ	(Length = 15 amino acids)

% amino acid sequence identity =

(the number of identically matching amino acid residues between the two polypeptide sequences as determined by ALIGN-2) divided by (the total number of amino acid residues of the PRO polypeptide) =

5 divided by 10 = 50%

FIG. 5B

```
                            10                  20                  30                  40                  50
hTACI(265)  M S G L G R S R R G G R S R V D Q E E R F P Q G L W T G V A M R S C P E E Q Y W D P L L G T C M S C
hTACI       M S G L G R S R R G G R S R V D Q E E R F P Q G L W T G V A M R S C P E E Q Y W D P L L G T C M S C

                            60                  70                  80                  90                  100
hTACI(265)  K T I C N H Q S Q R T C A A F C R S L S C R K E Q G K F Y D H L L R D C I S C A S I C G Q H P K Q C
hTACI       K T I C N H Q S Q R T C A A F C R S L S C R K E Q G K F Y D H L L R D C I S C A S I C G Q H P K Q C

                            110                 120                 130                 140                 150
hTACI(265)  A Y F C E N K L R S P V N L P P E L R R Q R S G E V E N N S D N S G R Y Q G L E H R G S E A S P A L
hTACI       A Y F C E N K L R S P V N L P P E L R R Q R S G E V E N N S D N S G R Y Q G L E H R G S E A S P A L

                            160                 170                 180                 190                 200
hTACI(265)  P G L K L S A D Q V A L V Y S T L G L C L C A V L C C F L V A V A C F L K K R G D P C S C Q P R S R
hTACI       P G L K L S A D Q V A L V Y S T L G L C L C A V L C C F L V A V A C F L K K R G D P C S C Q P R S R

                            210                 220                 230                 240                 250
hTACI(265)  P R Q S P A K S S Q D H A M E A G S P V S T S P E P V E T C S F C F P E C R A P T Q E S A V T P G T
hTACI       P R Q S P A K S S Q D H A M E A G S P V S T S P E P V E T C S F C F P E C R A P T Q E S A V T P G T

                            260                 270                 280                 290                 300
hTACI(265)  P D P T C A G R T - - - - - - - - - - - - - - - - - - - - - - - - A P P R E G - - - - Z
hTACI       P D P T C A G R W G C H T R T T V L Q P C P H I P D S G L G I V C V P A Q E G G P G A Z
```

FIG. 6

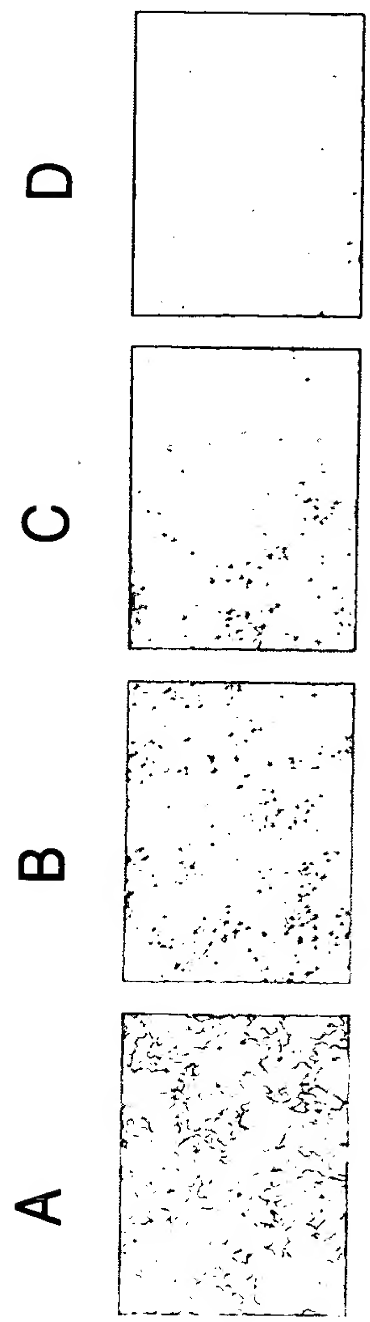


FIG. 7

FIG. 8B

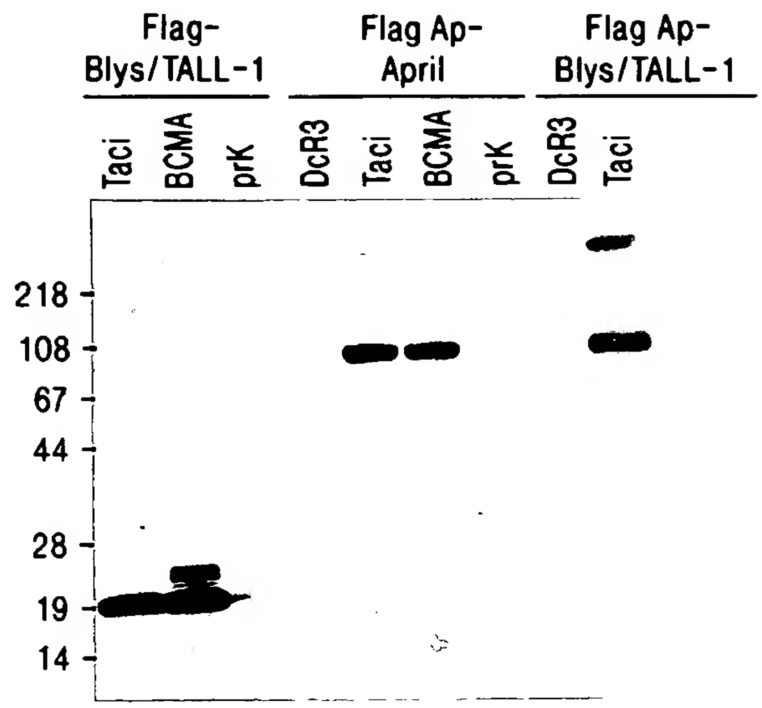
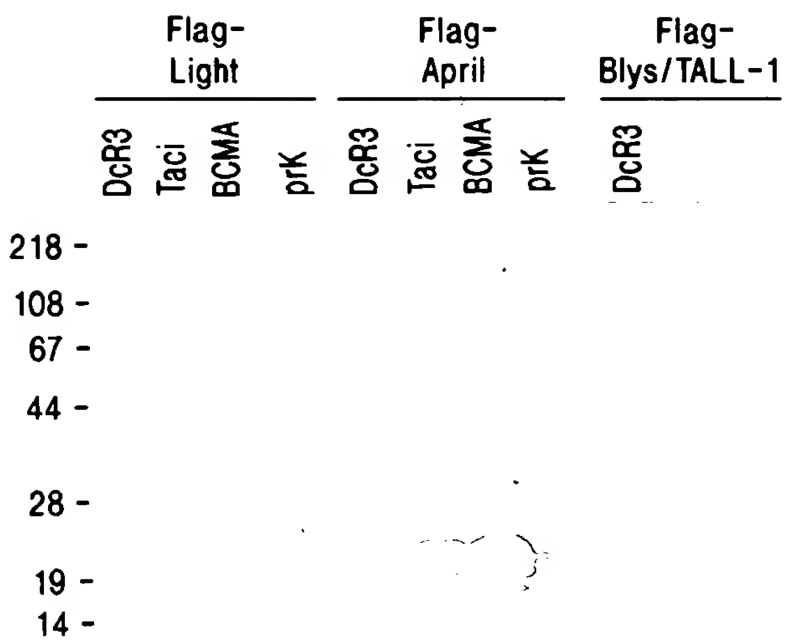
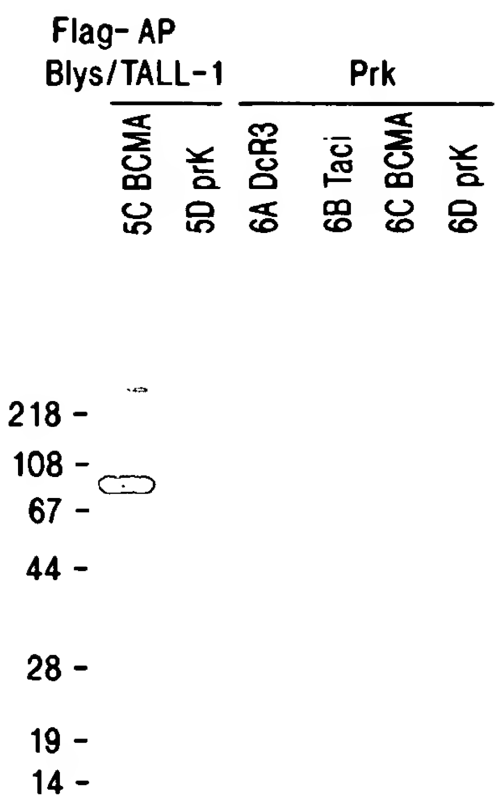


FIG. 8A





Ip:with protein A
WB with α Flag HR

FIG. 8C

FIG. 8D

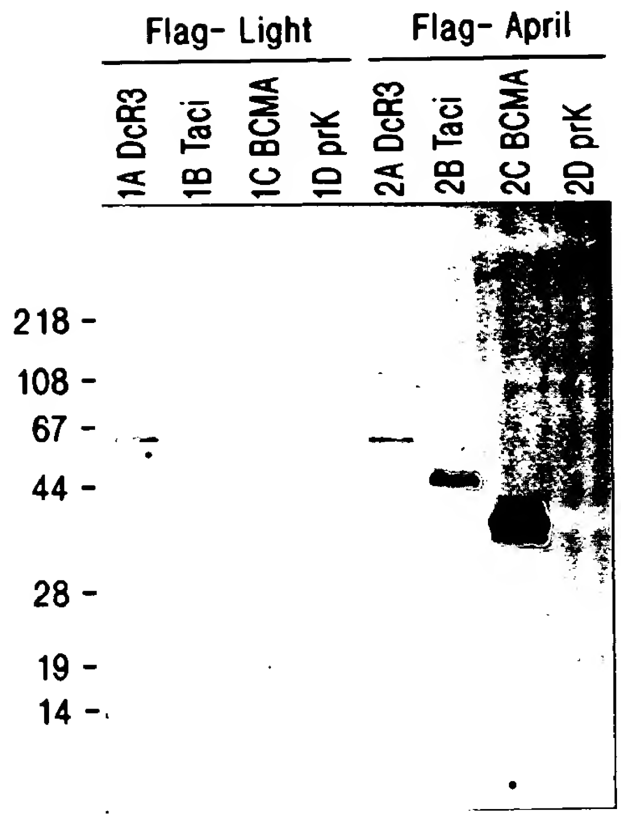
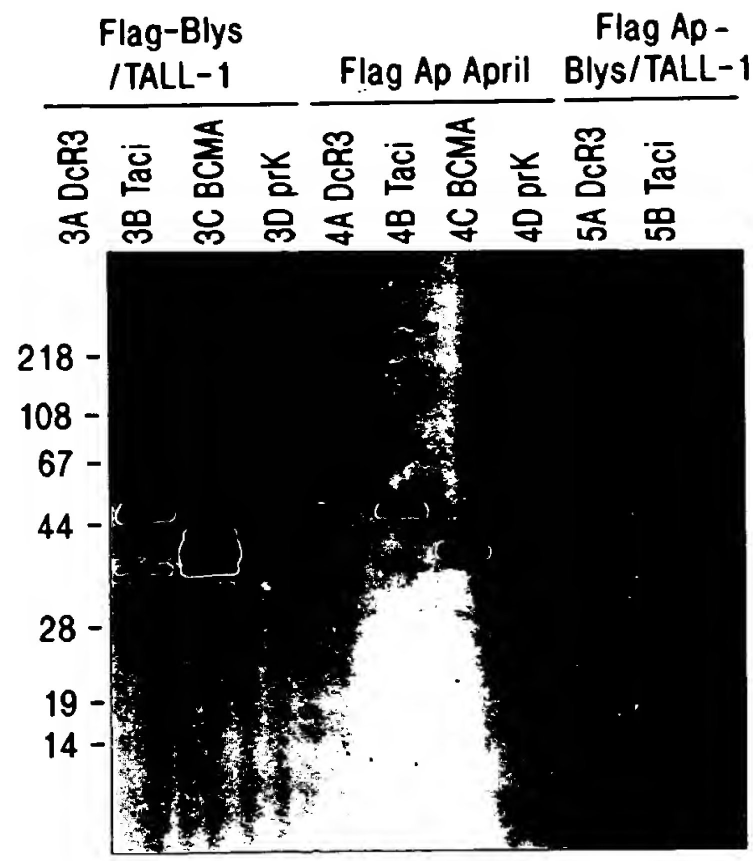


FIG. 8E



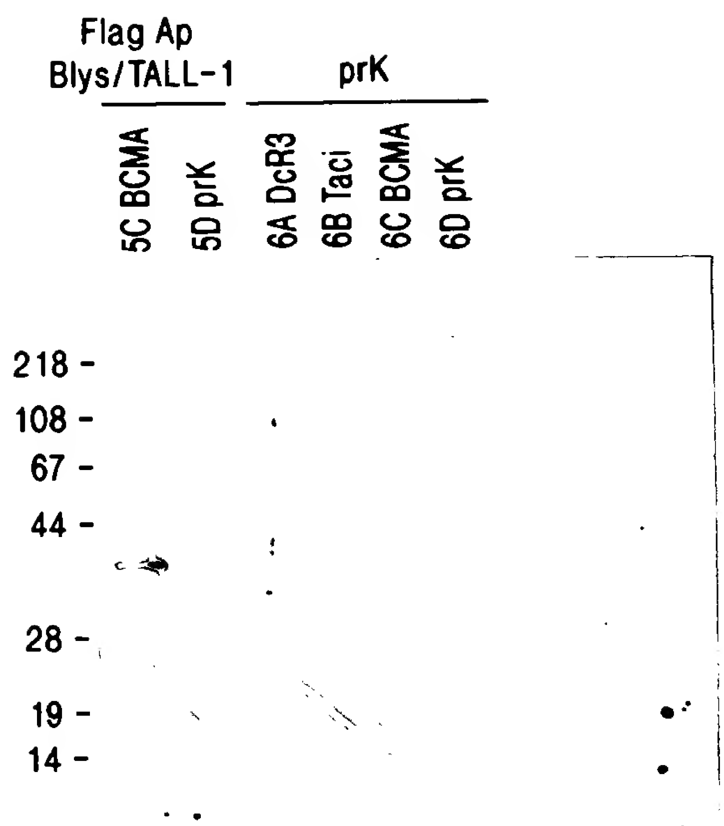


FIG. 8F

Ip: with
α Flag
WB: with
α HuIgG. HRP

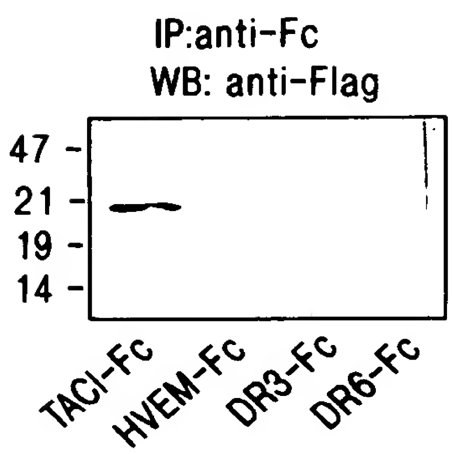

IP:anti-Fc
WB: anti-Flag
47
21
19
14
TACI-Fc
HVEM-Fc
DR3-Fc
DR6-Fc

FIG. 8G

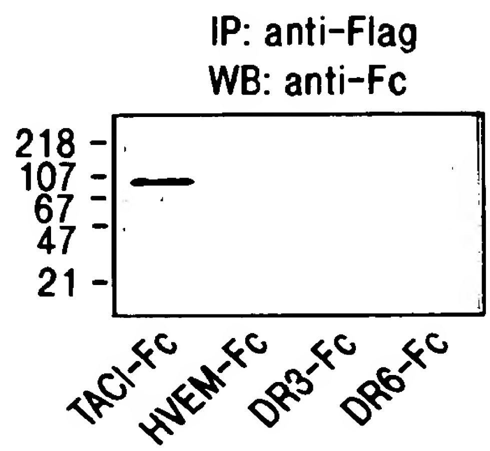

IP: anti-Flag
WB: anti-Fc
218
107
67
47
21
TACI-Fc
HVEM-Fc
DR3-Fc
DR6-Fc

FIG. 8H

FIG. 9A

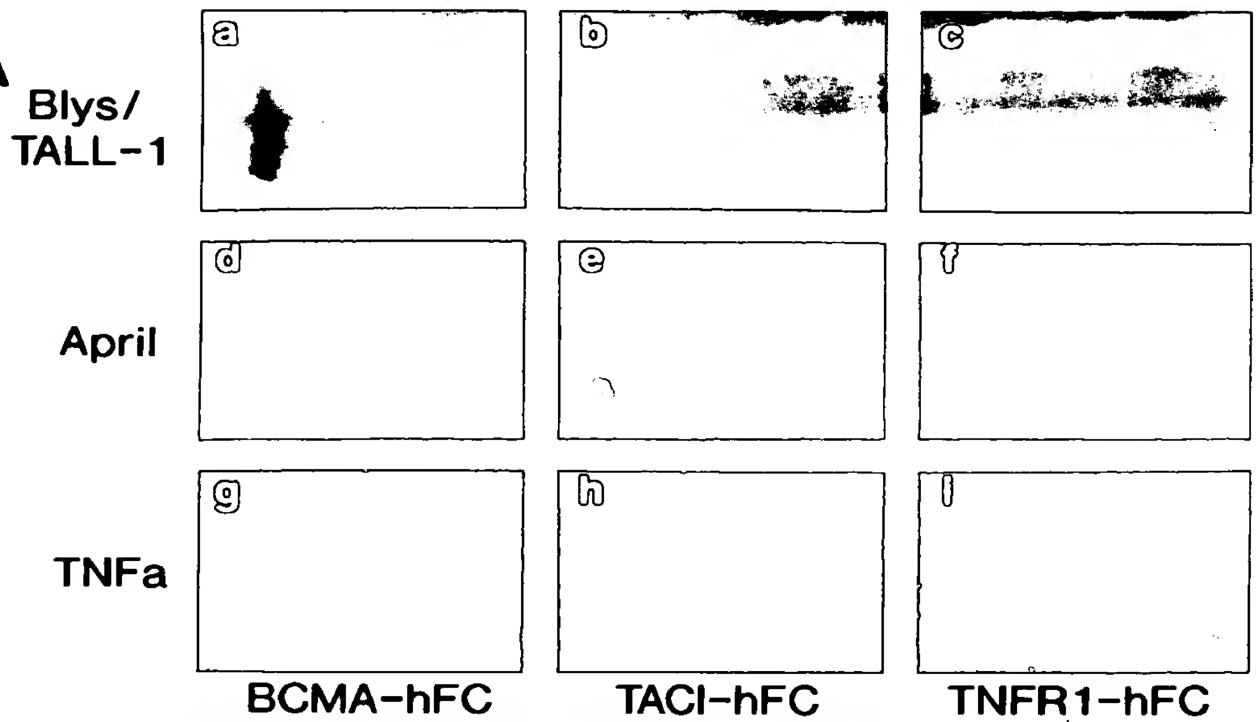
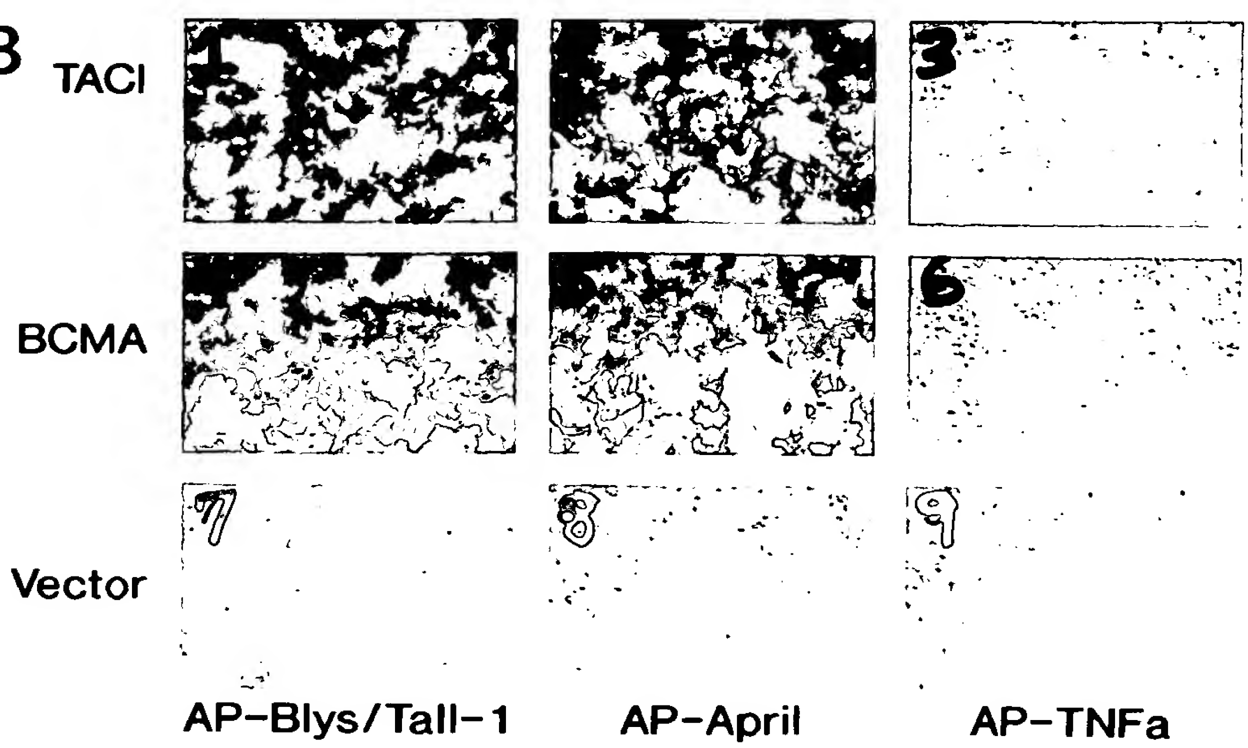

Blys/
TALL-1
April
TNFa
a
b
c
d
e
f
g
h
i
BCMA-hFC
TACI-hFC
TNFR1-hFC

FIG. 9B


TACI
BCMA
Vector
3
6
7
8
9
AP-Blys/Tall-1
AP-April
AP-TNFa

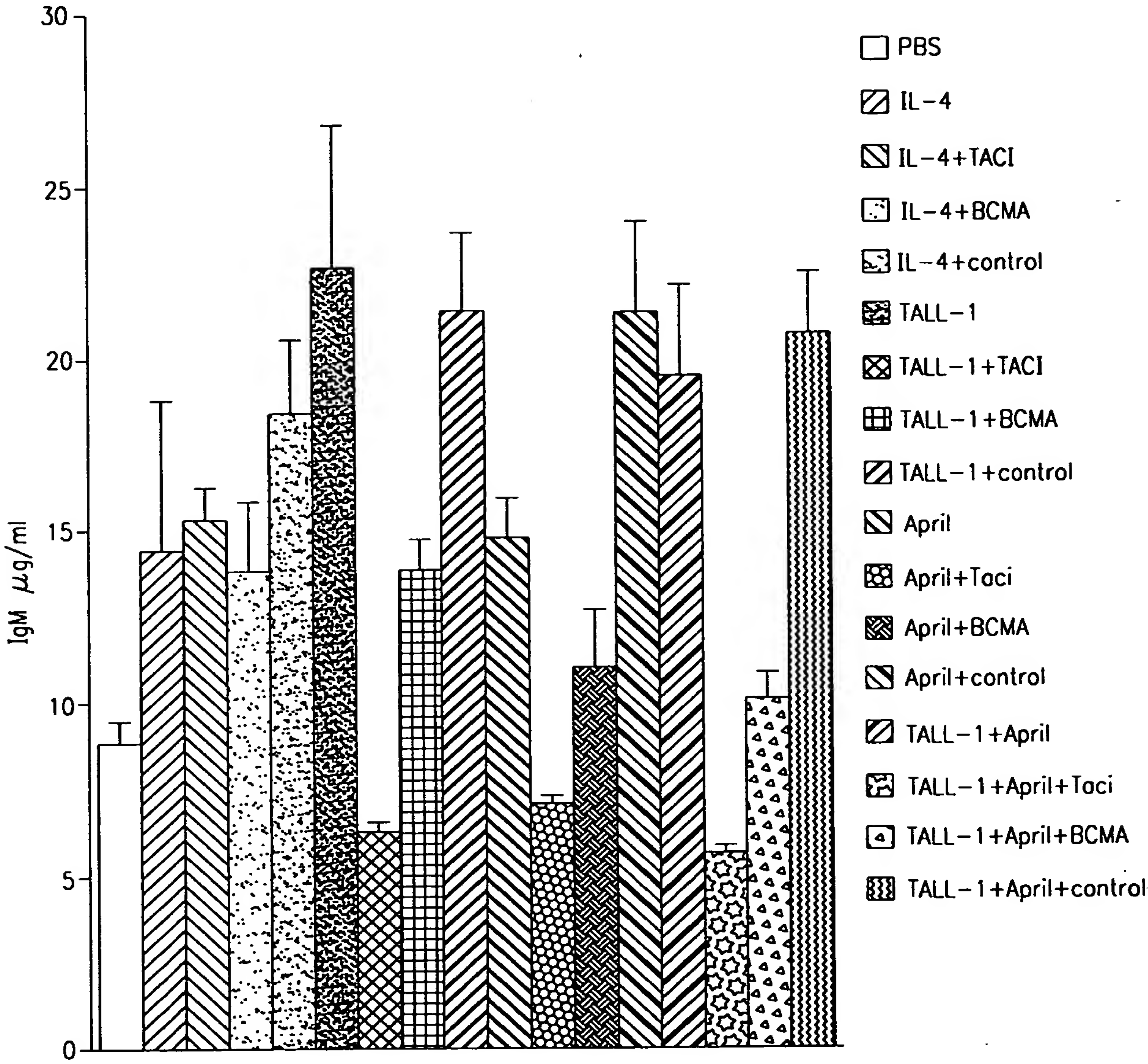

30
25
20
15
10
5
0
IgM μg/ml
PBS
IL-4
IL-4+TACI
IL-4+BCMA
IL-4+control
TALL-1
TALL-1+TACI
TALL-1+BCMA
TALL-1+control
April
April+Taci
April+BCMA
April+control
TALL-1+April
TALL-1+April+Taci
TALL-1+April+BCMA
TALL-1+April+control

FIG. 10

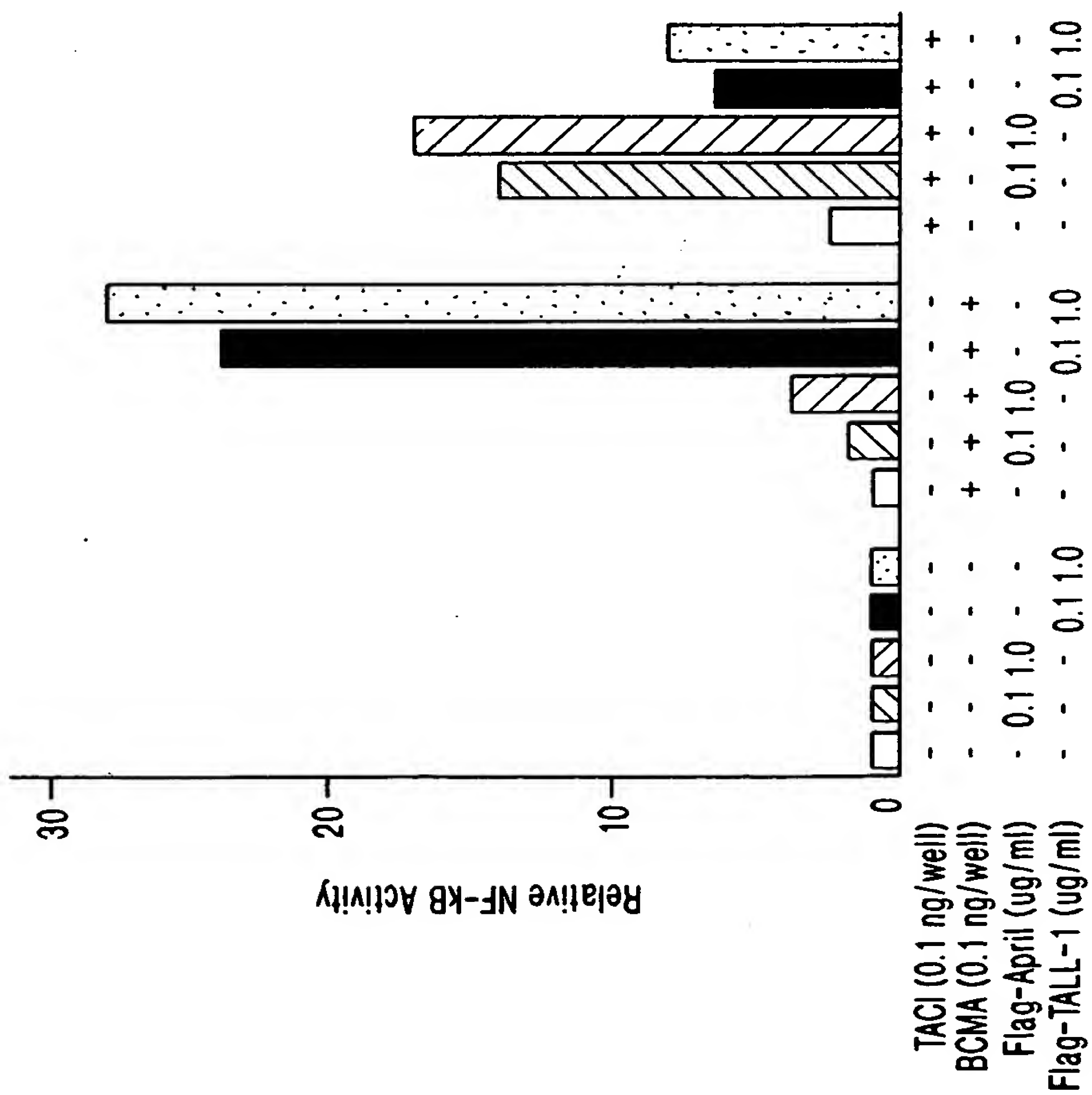


FIG. 11A

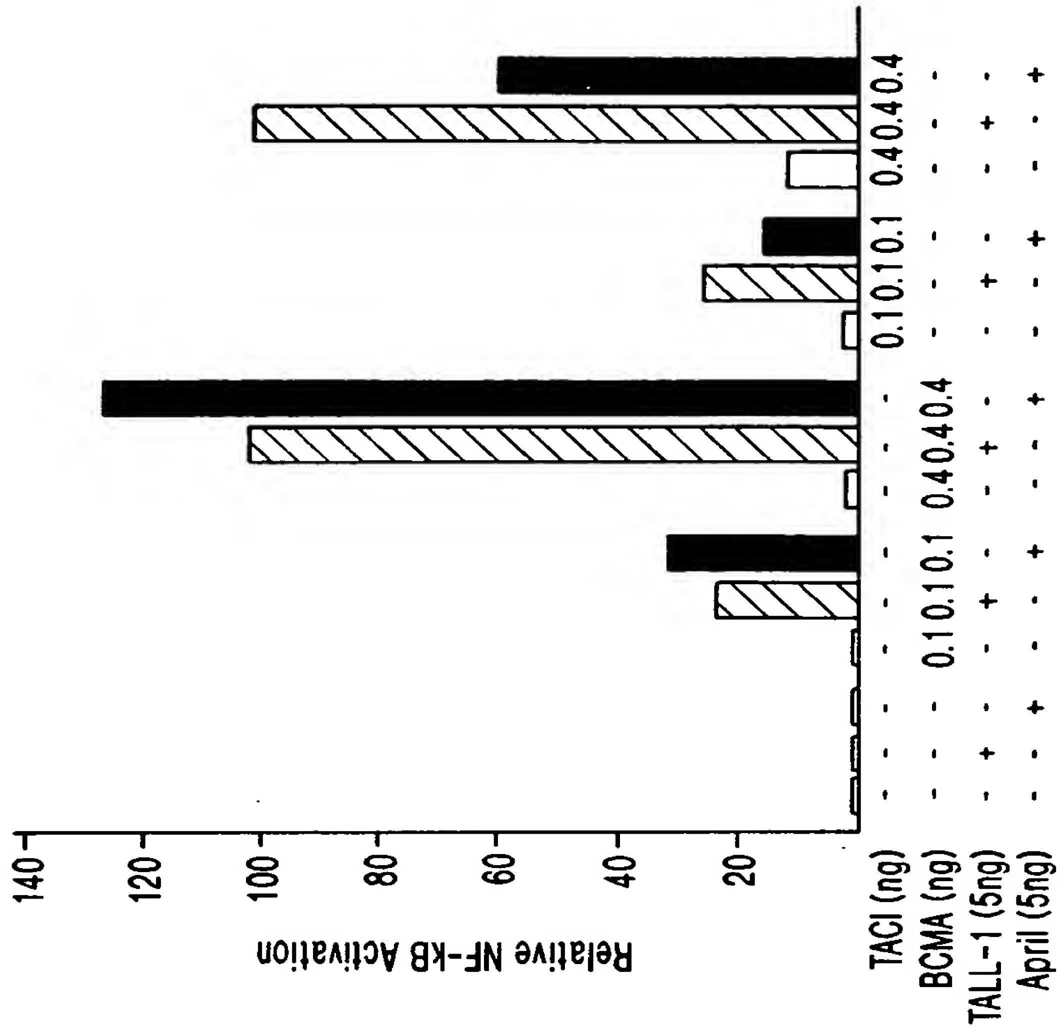


FIG. 11B

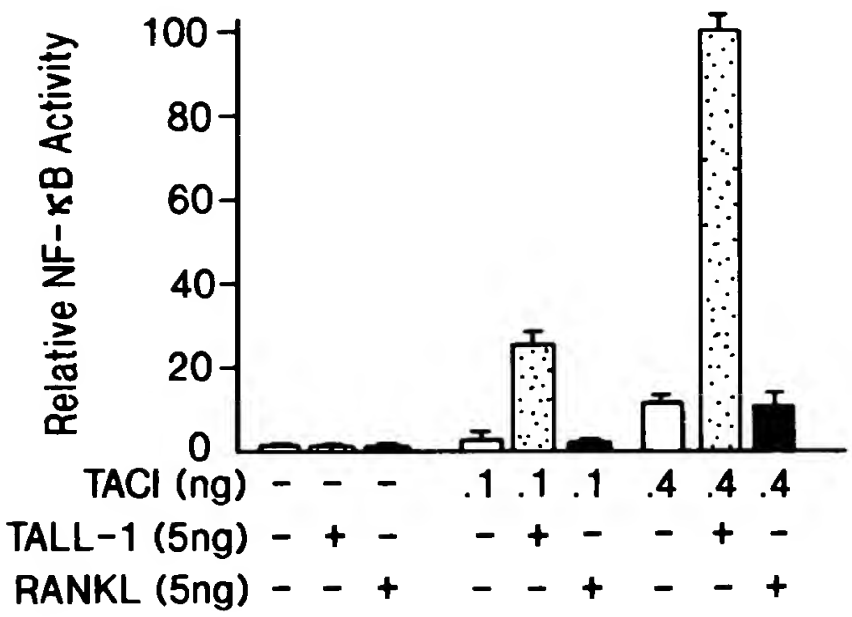


FIG. 11C

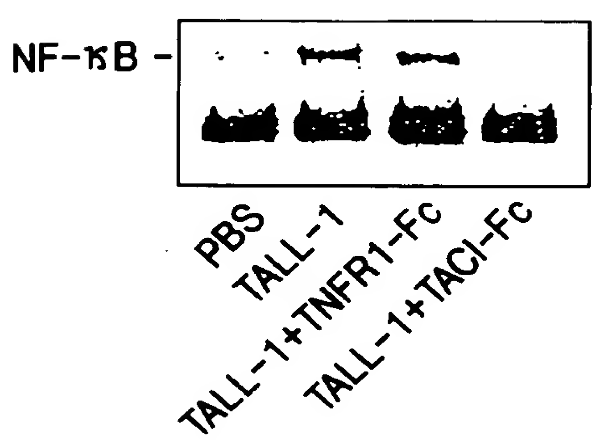


FIG. 11D

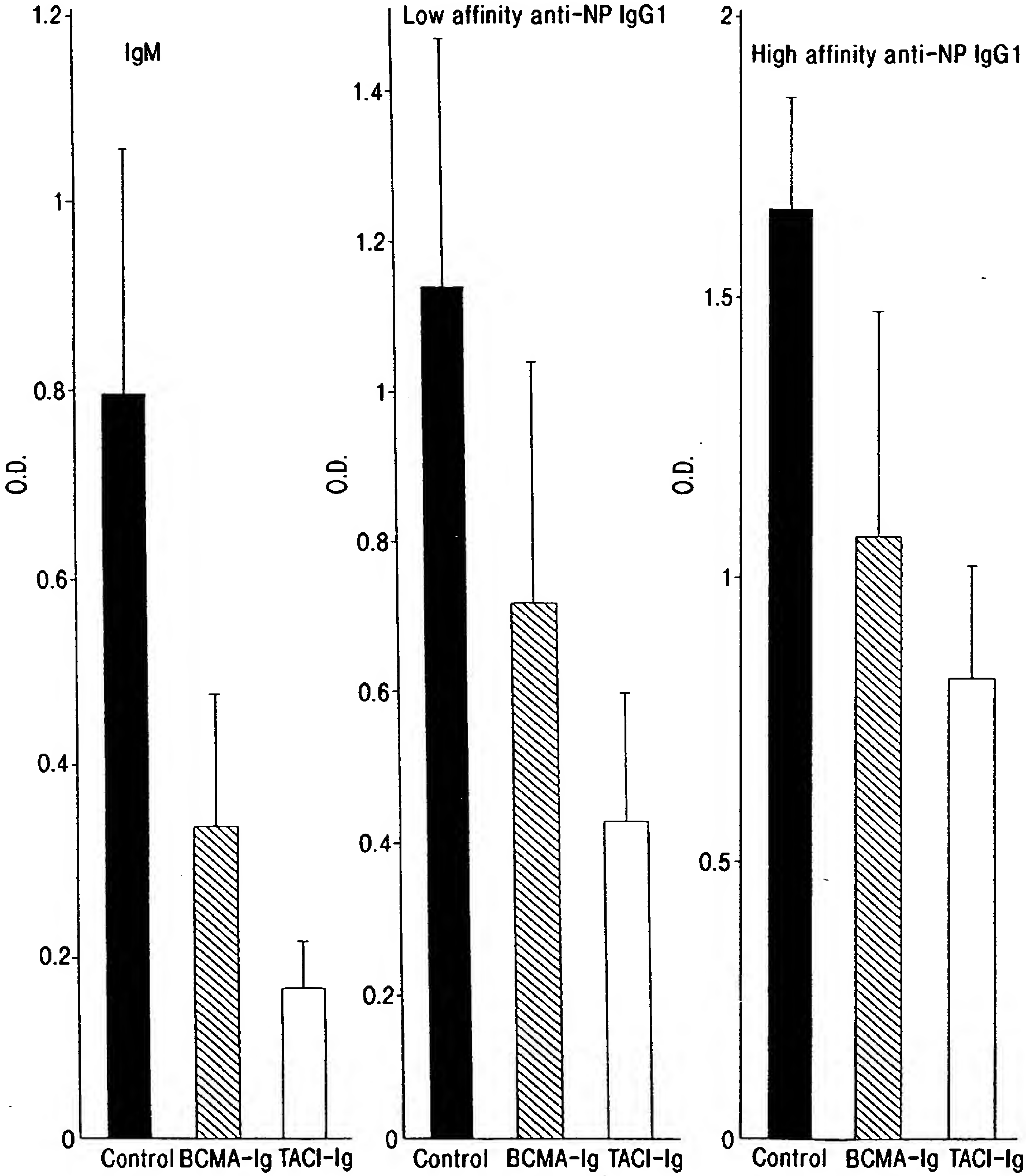


FIG. 12A FIG. 12B FIG. 12C

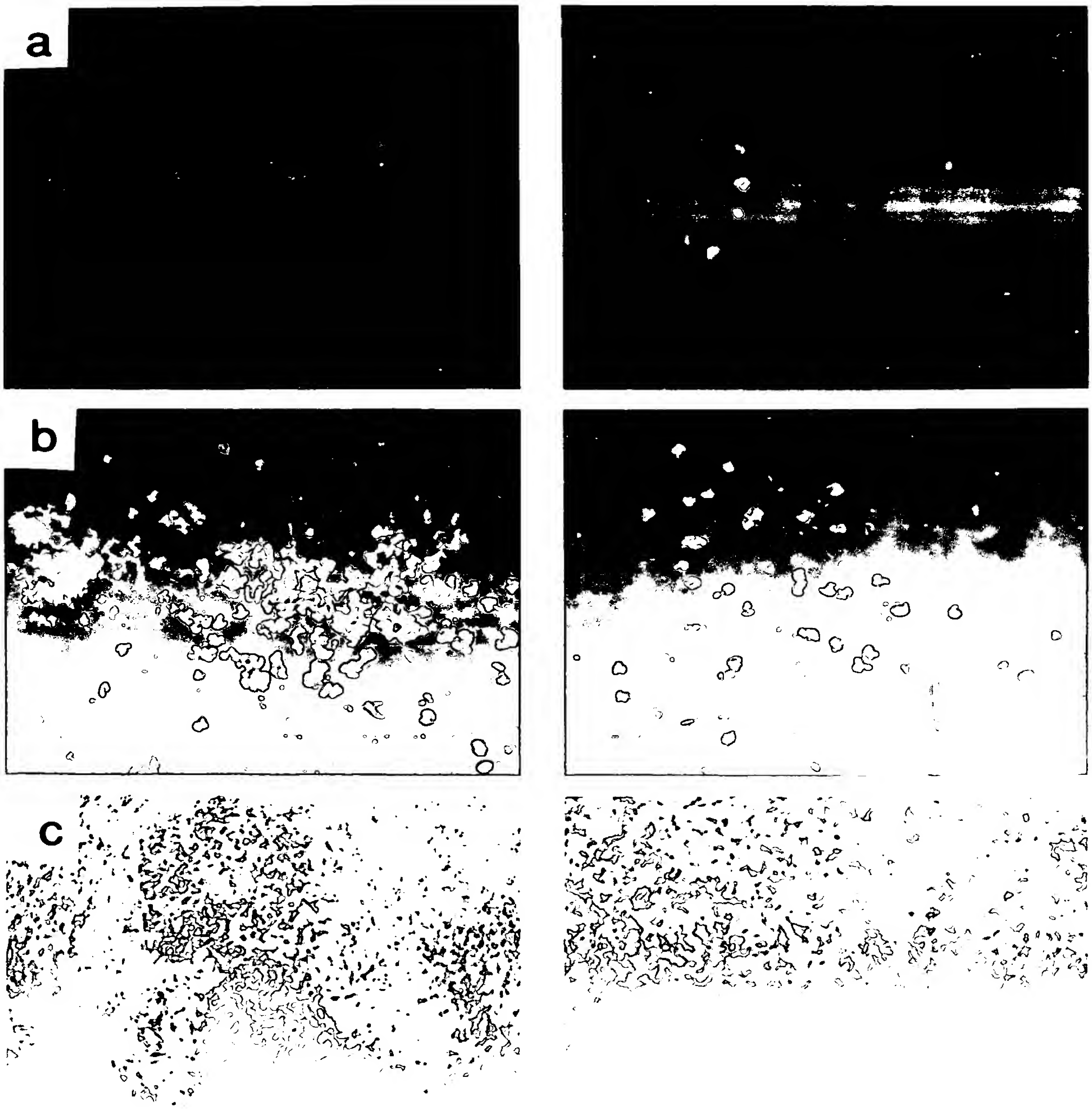


FIG. 13A

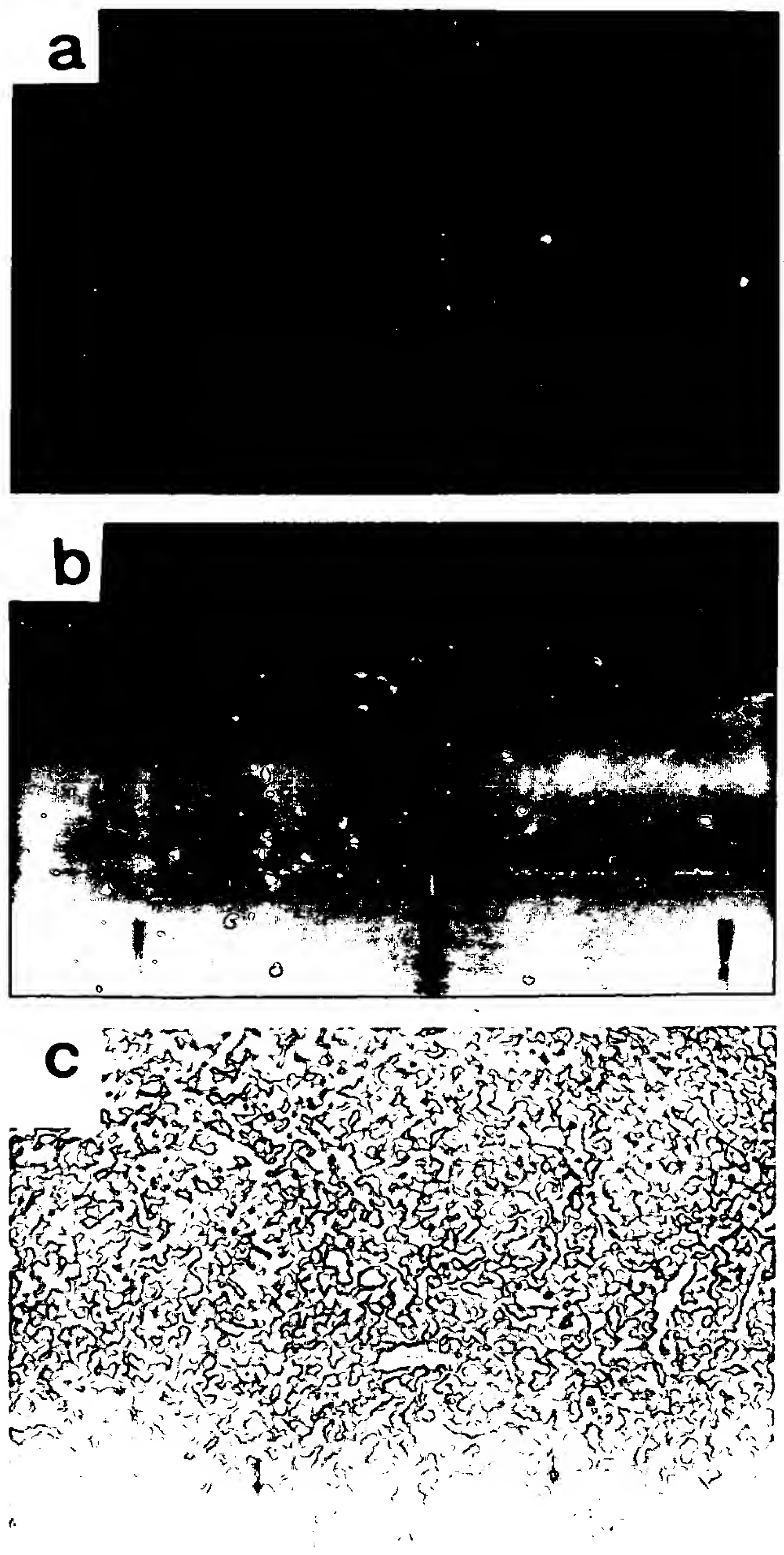


FIG. 13B

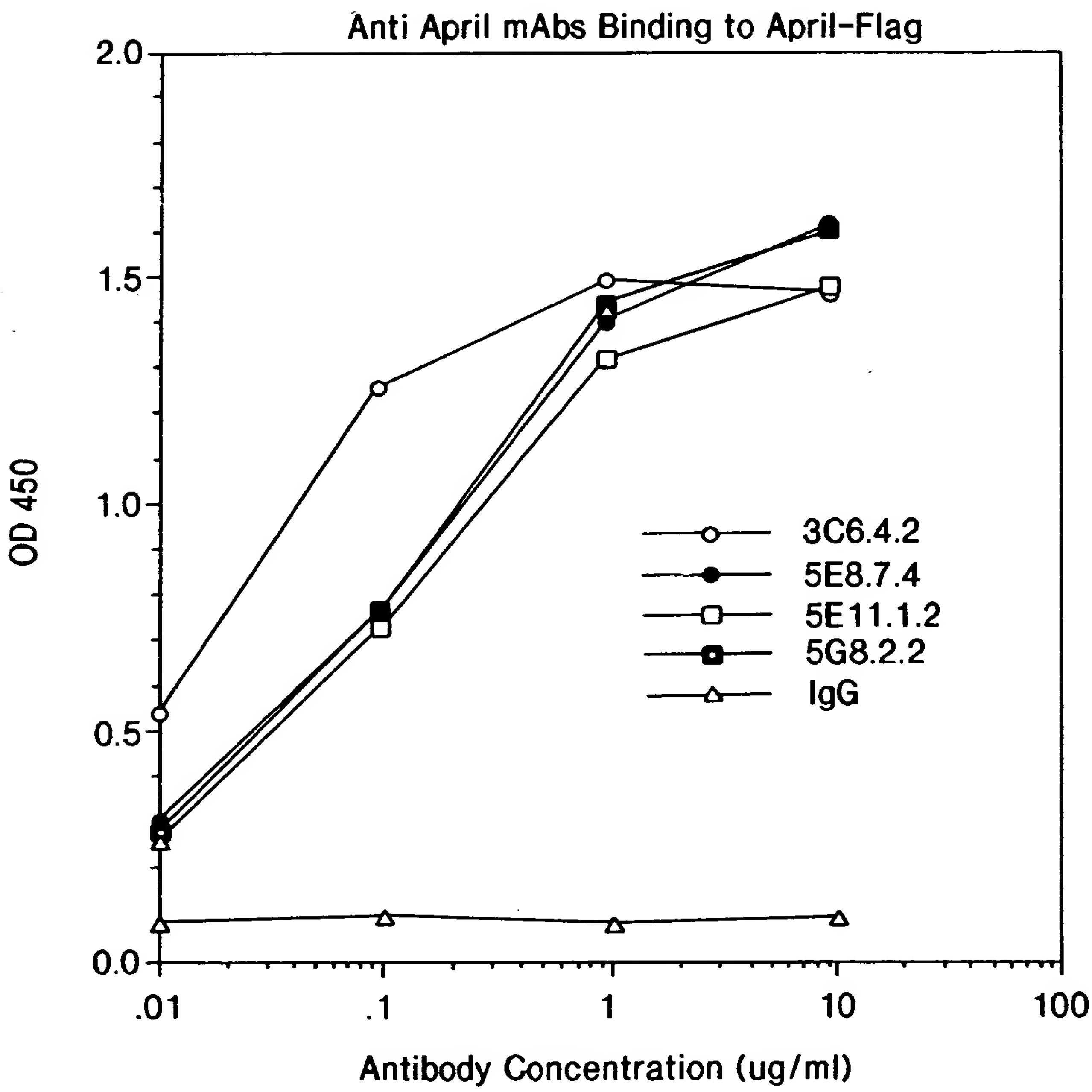

Anti April mAbs Binding to April-Flag
2.0
1.5
1.0
0.5
0.0
OD 450
.01
.1
1
10
100
Antibody Concentration (ug/ml)
3C6.4.2
5E8.7.4
5E11.1.2
5G8.2.2
IgG

FIG. 14A

Summary of anti–April mABs

mAb	Isotype	Epitope	Binding (ELISA) April	TALL	Block April binding to BCMA	TACI
3C6.4.2	IgG2a	C	++	–	+++	+
5E8.7.4	IgG2a	A	++	–	–	–
5E11.1.2	IgG1	C?	++	–	+	+
5G8.2.2	IgG2a	B	++	–	–	–

MAb 5E11.1.2 may bind to the similar epitope.

FIG. 14B

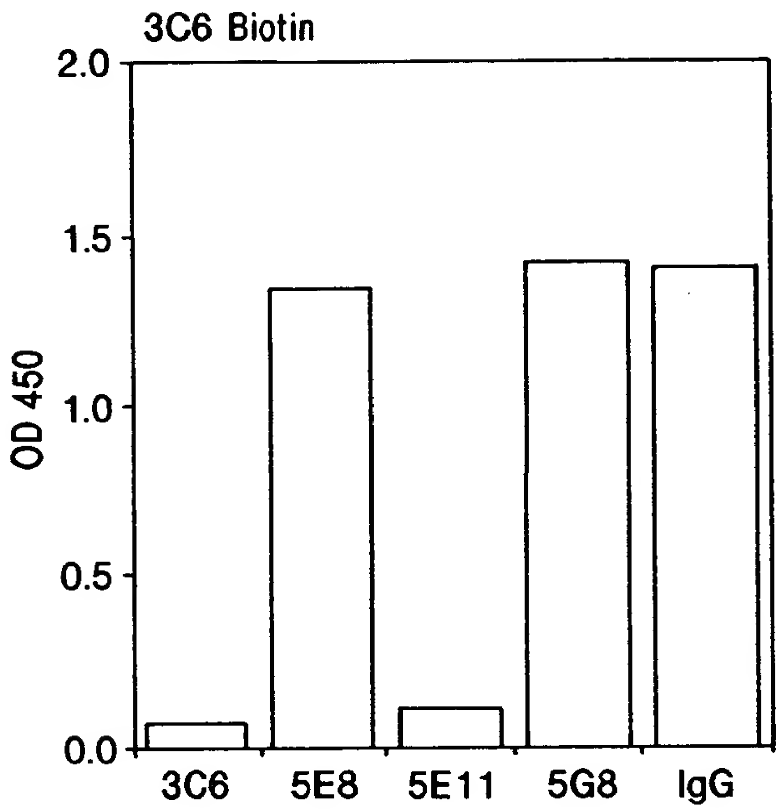


FIG. 15A

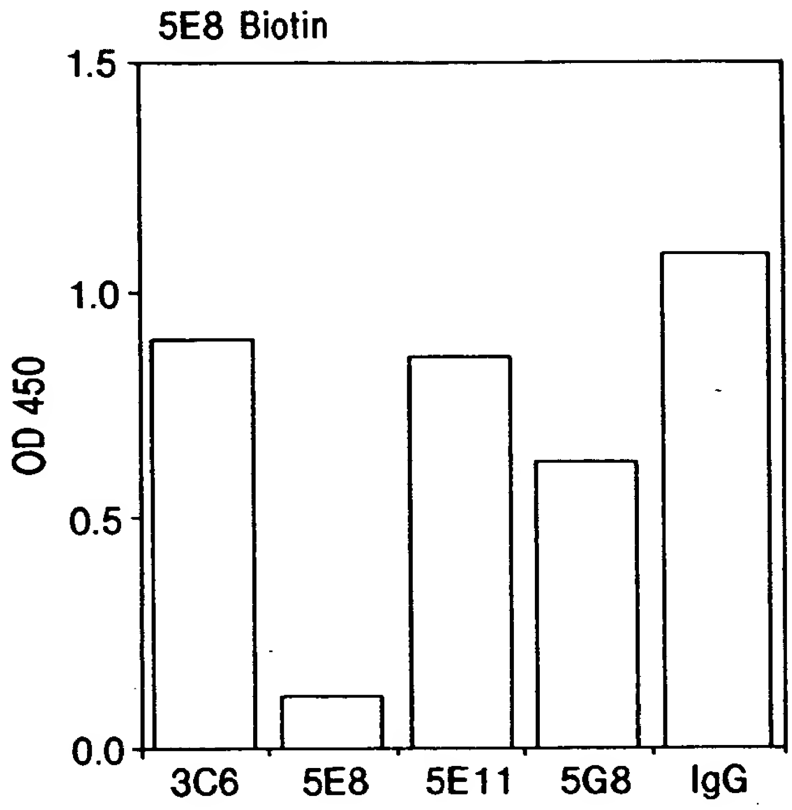


FIG. 15B

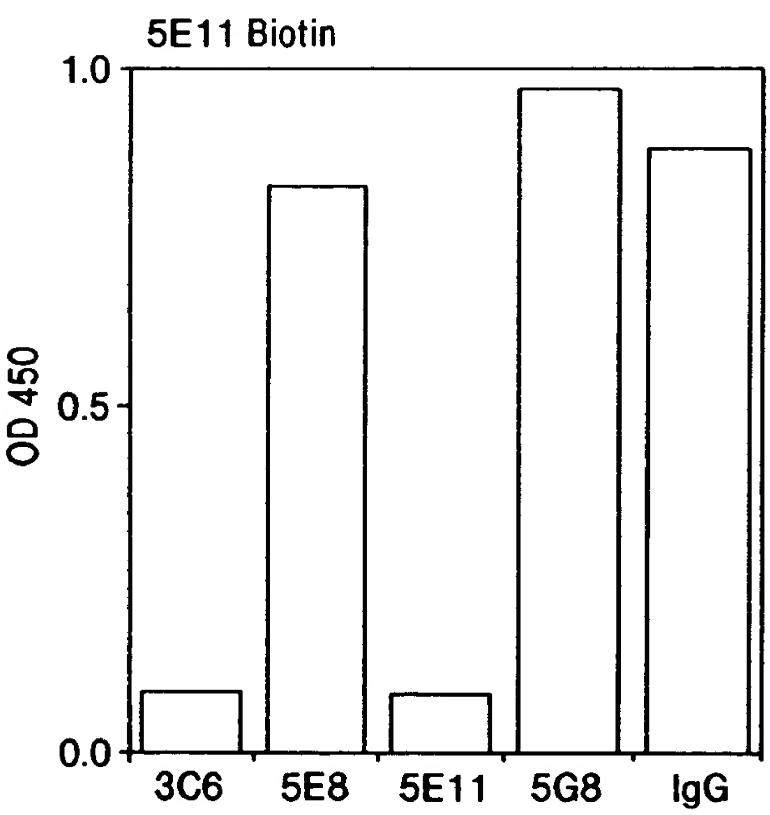


FIG. 15C

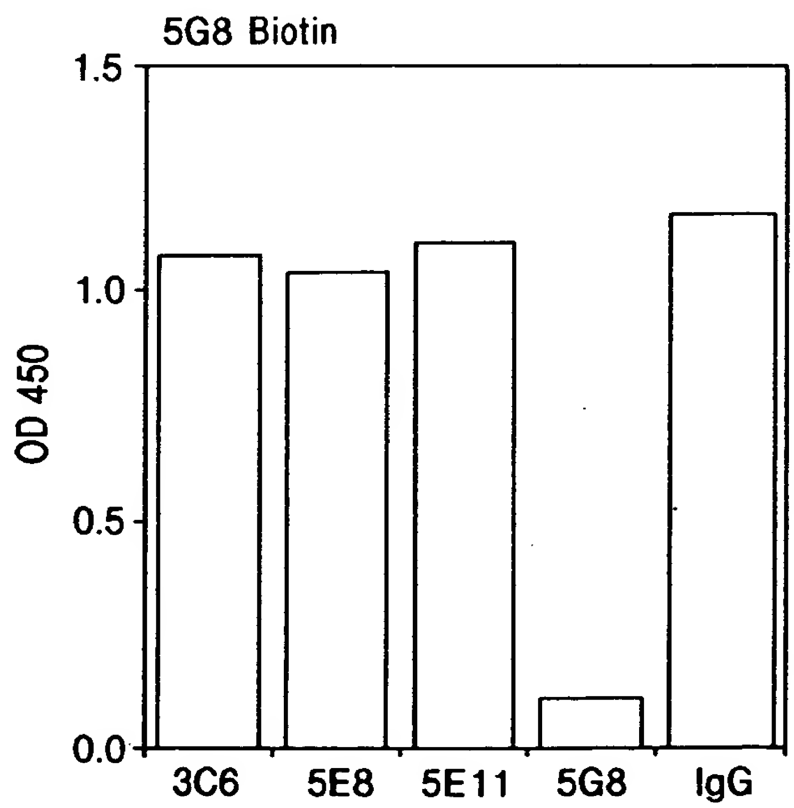


FIG. 15D

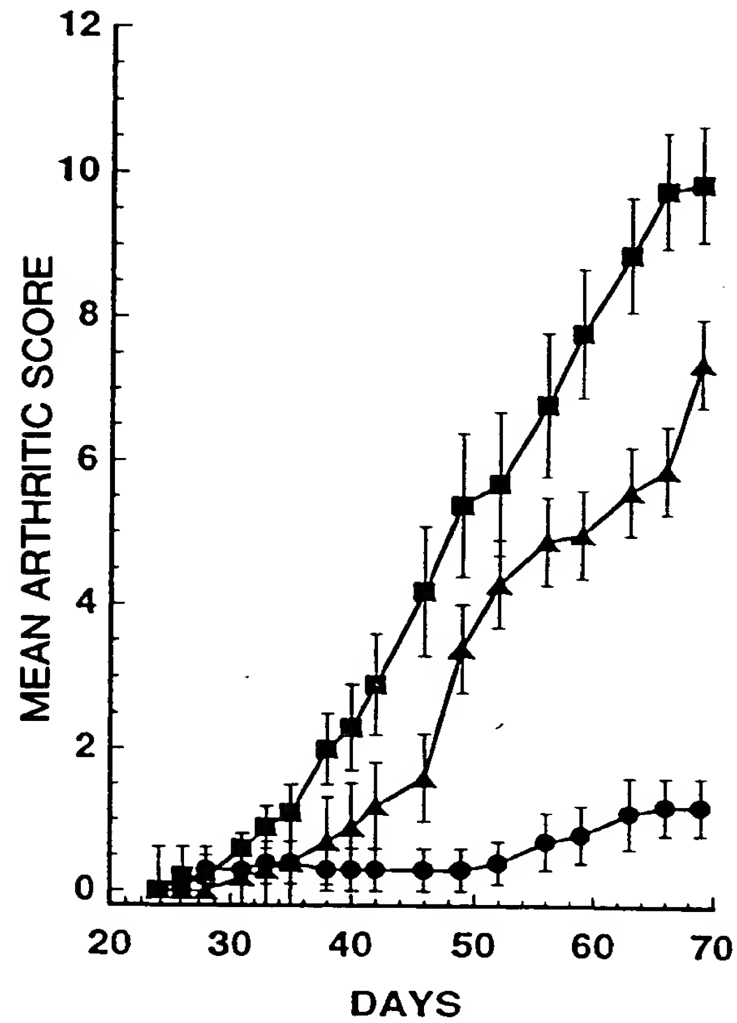


FIG. 16A

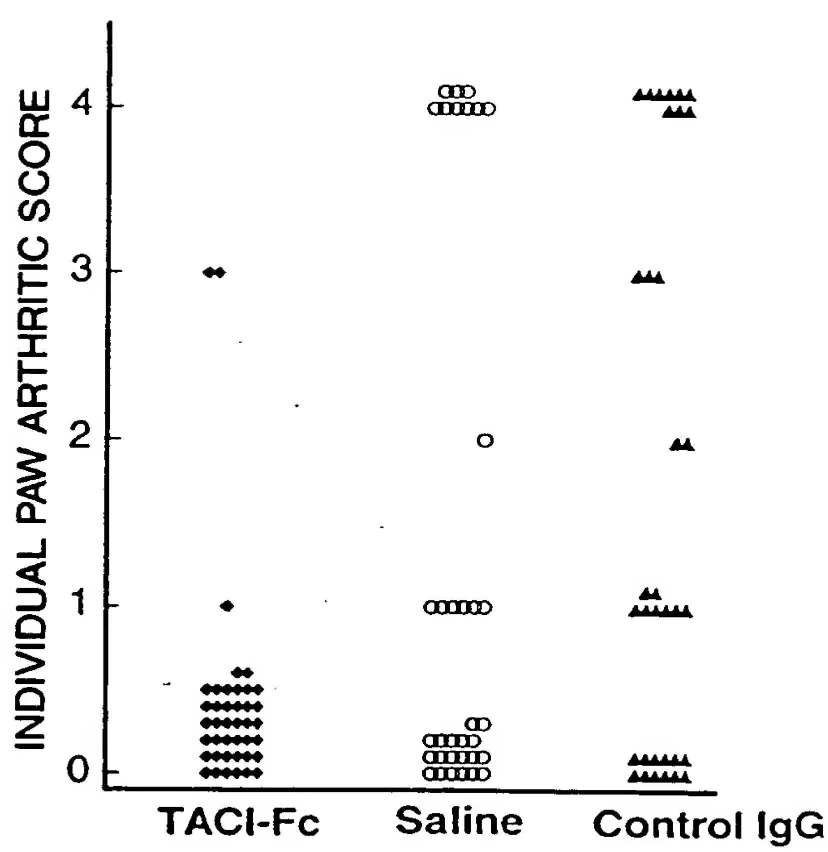


FIG. 16B

FIG. 17A

FIG. 17B

FIG. 17C

FIG. 17D

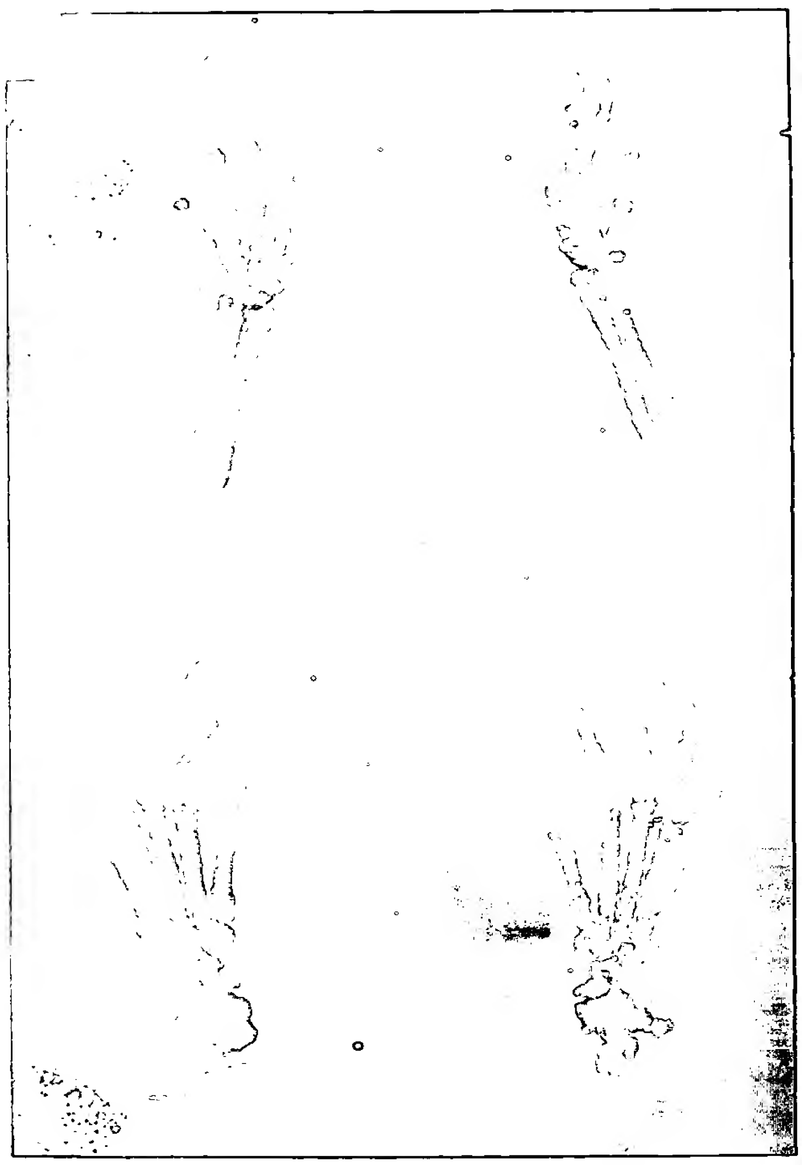


FIG. 17E

FIG. 17F

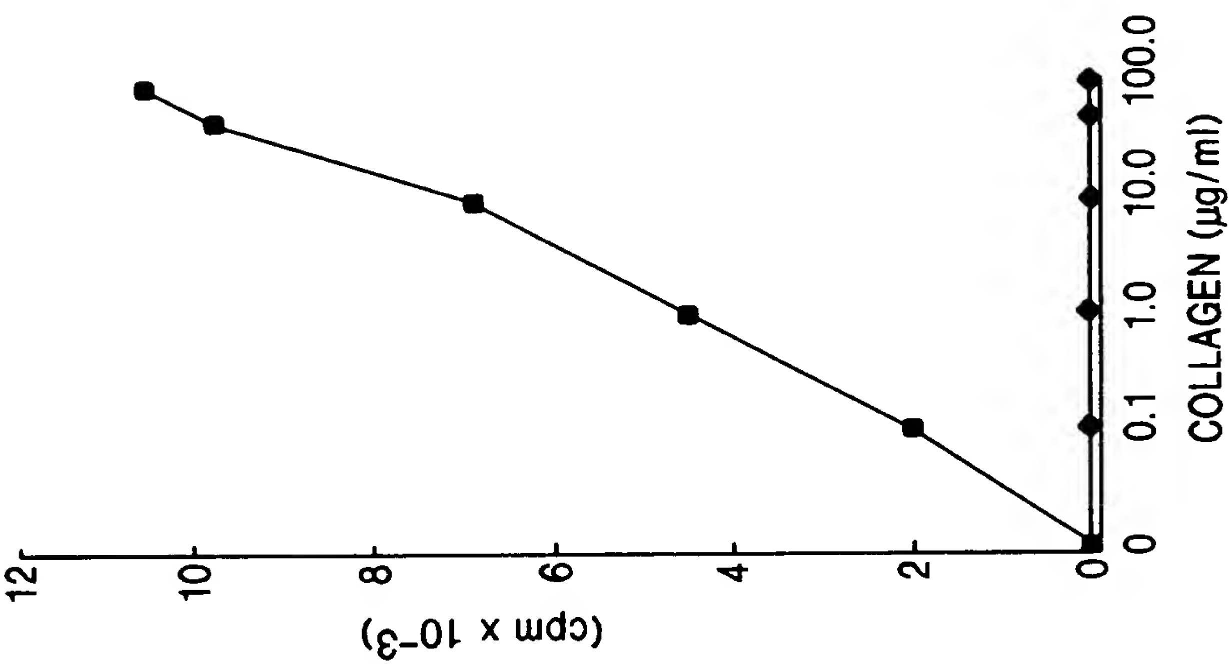


FIG. 18C

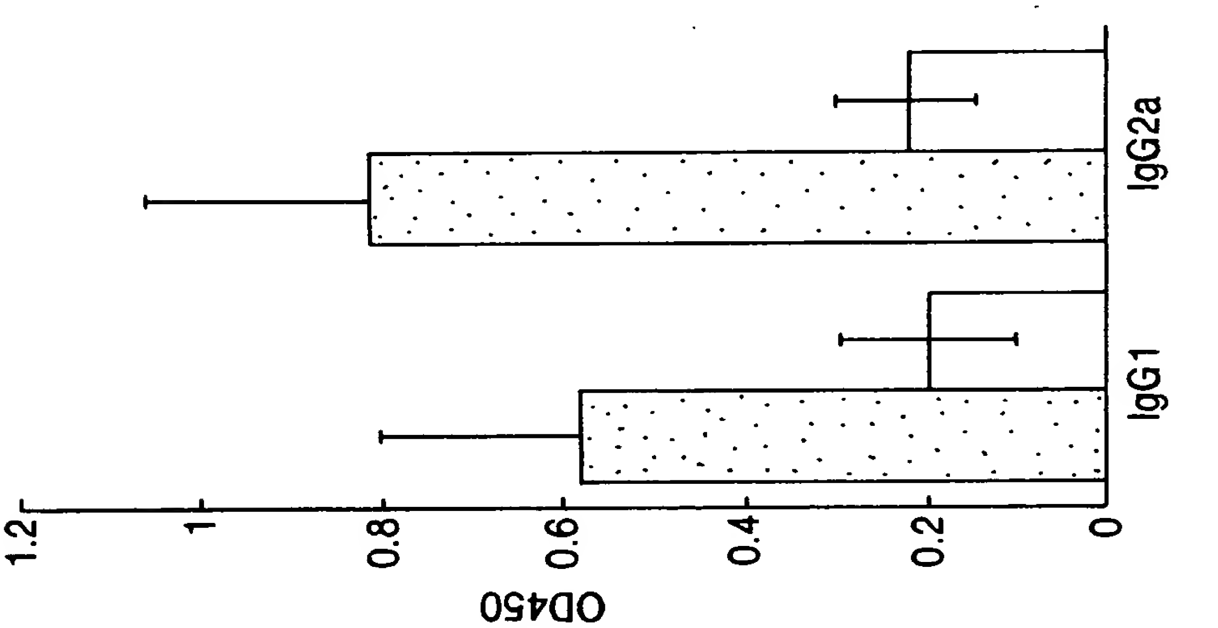


FIG. 18B

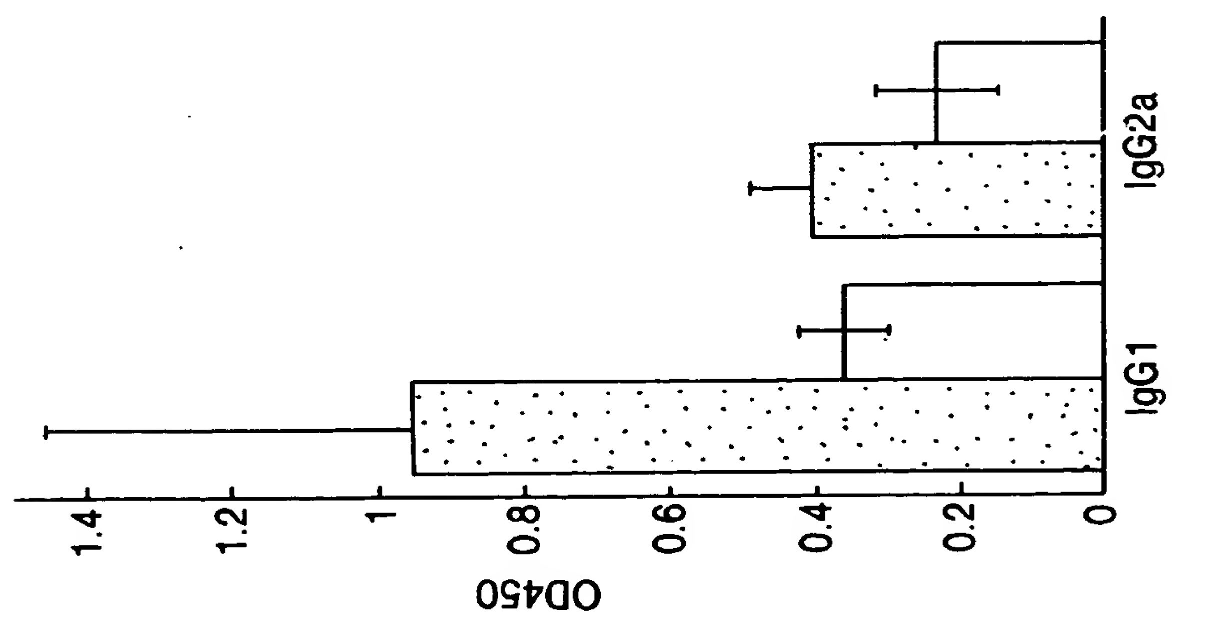


FIG. 18A

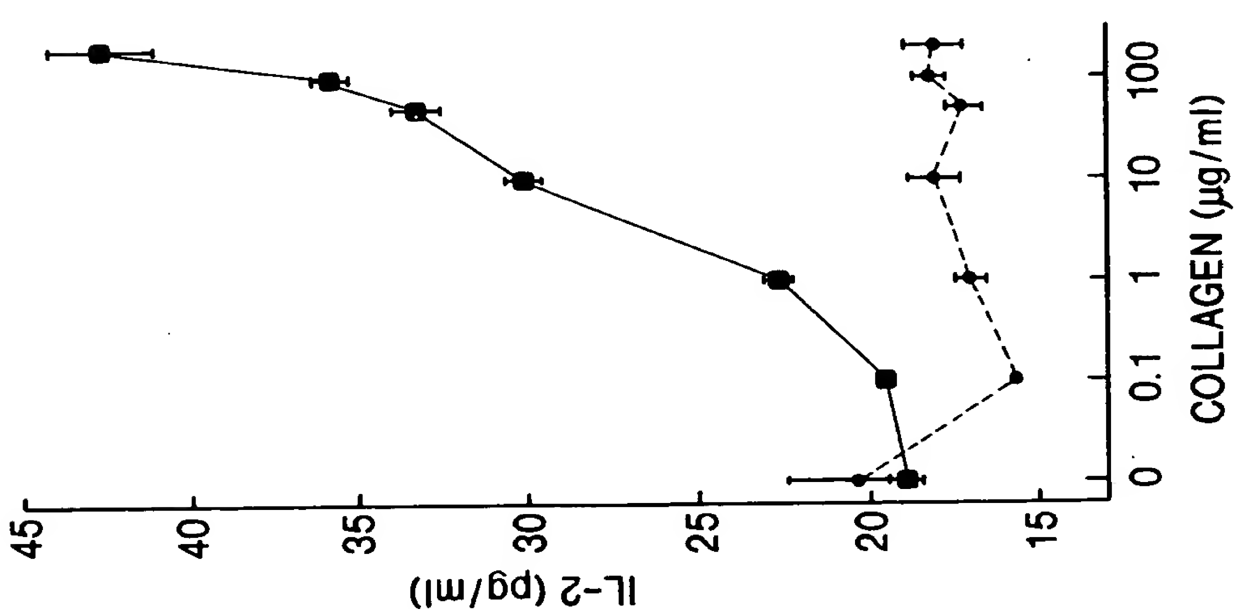


FIG. 18D

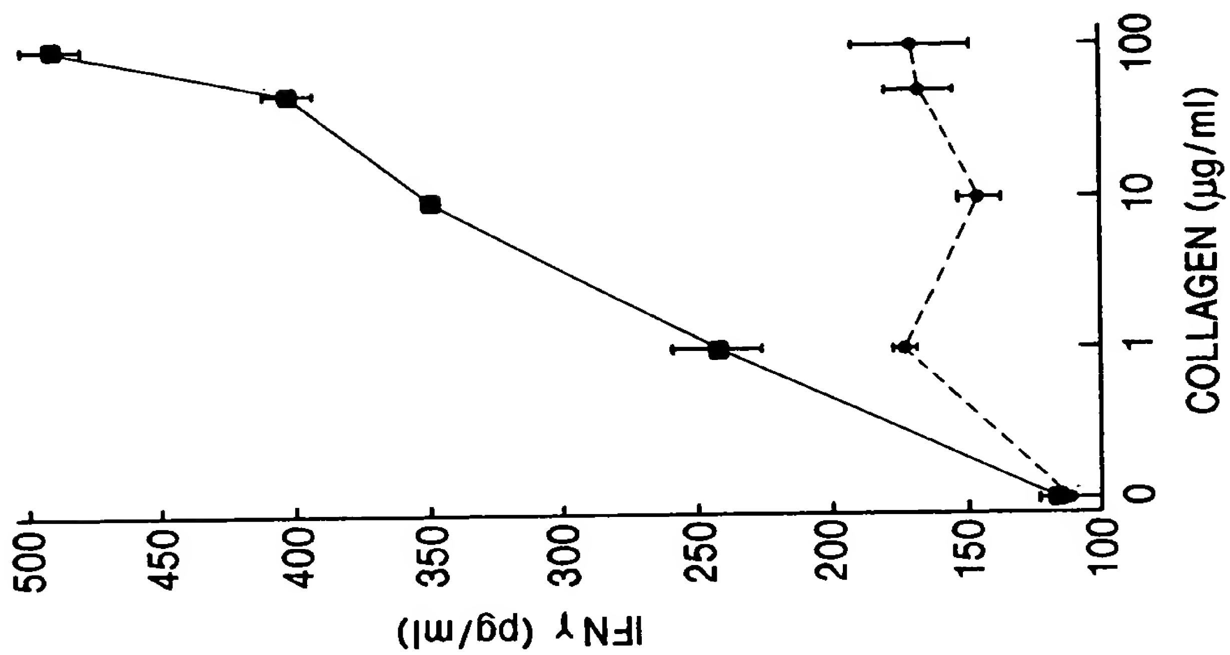


FIG. 18E

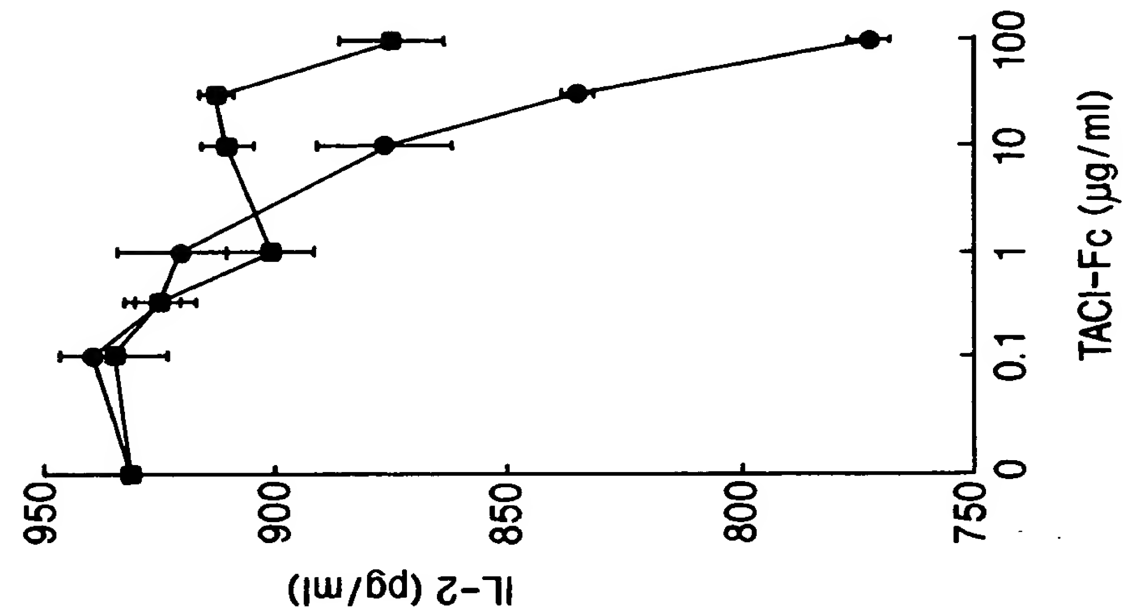


FIG. 19B

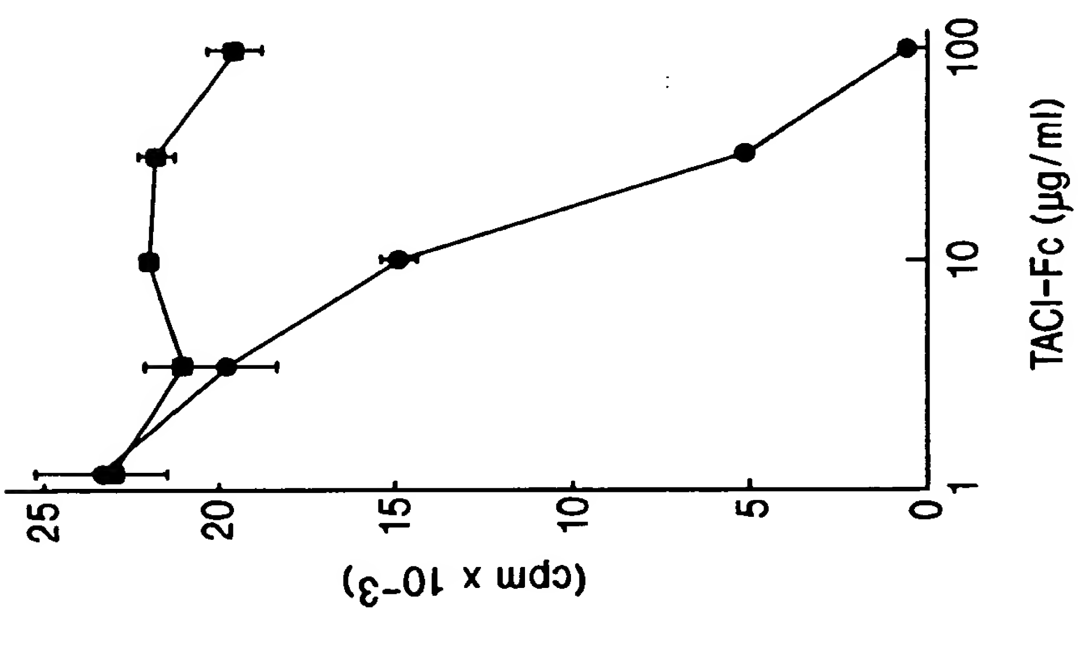


FIG. 19A

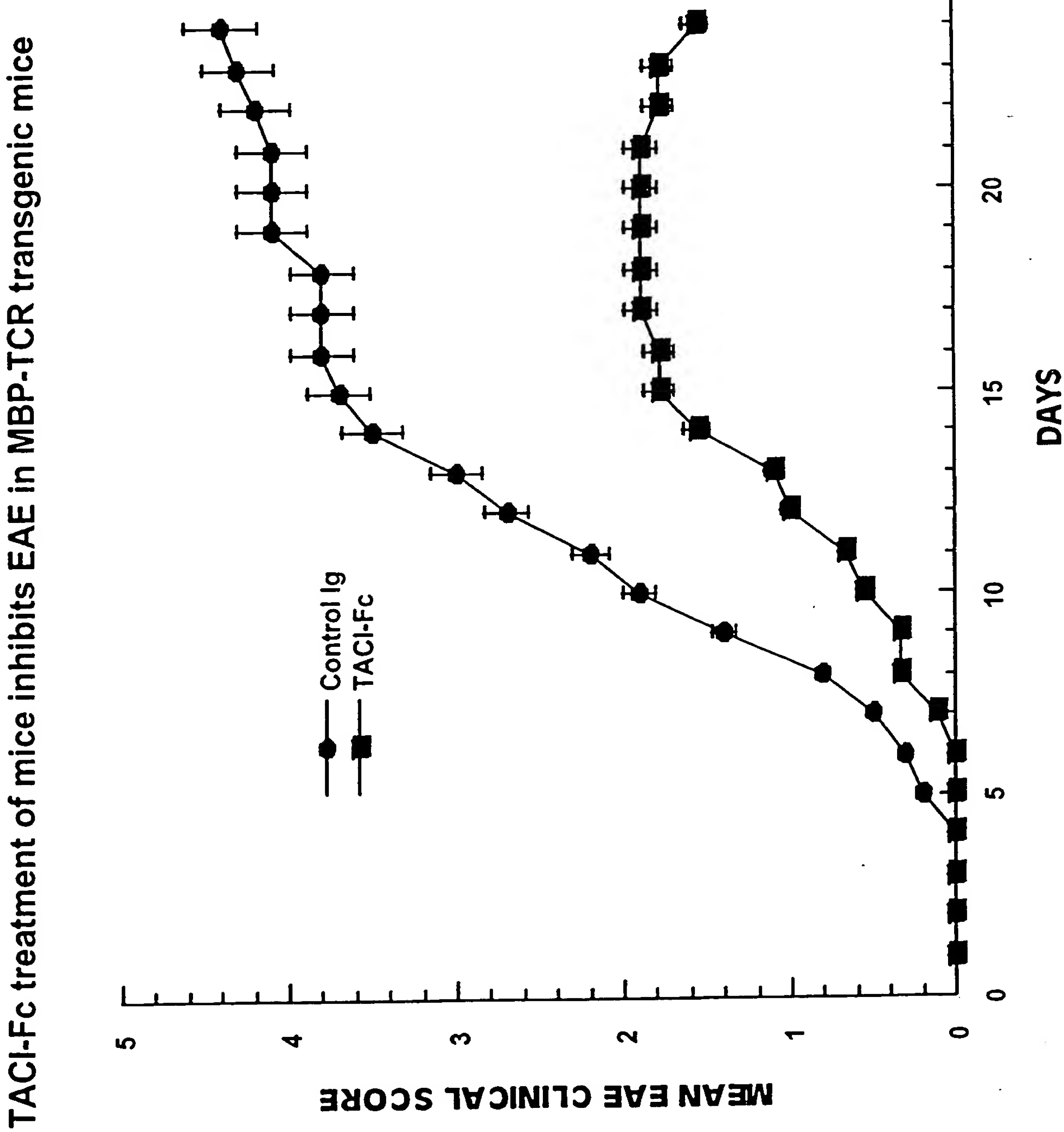

TACI-Fc treatment of mice inhibits EAE in MBP-TCR transgenic mice
Control Ig
TACI-Fc
MEAN EAE CLINICAL SCORE
0
1
2
3
4
5
DAYS
0
5
10
15
20
25

FIG. 20